NETWORK WORLD
The Newsweekly of User Networking Strategies

Volume 7, Number 8 An IDG Communications Publication February 19, 1990

DEC widens options for LAN servers

By Laura DiDio
Senior Editor

BOSTON — Digital Equipment Corp. used the Networld '90 local-area network show here last week to introduce two servers that come bundled with a DECnet-compatible version of Microsoft Corp.'s OS/2 LAN Manager and can be integrated into DECnet environments.

The company also unveiled a version of its Personal Computer System Architecture (PCSA) software that will enable workstation clients in DECnet networks to access both OS/2 LAN Manager servers and an enhanced version of the company's existing PC LAN/Server 3100.

Although the company announced last fall that it would support OS/2 workstation clients within DECnet, the decision to allow OS/2 LAN Manager servers to participate as full peers in DECnet represents a radical departure in corporate strategy. Until now, the only servers DEC has recognized within DECnet have been its VMS machines.

By providing the means to integrate OS/2 LAN Manager servers into DECnet, LAN users will be able to access the full suite of

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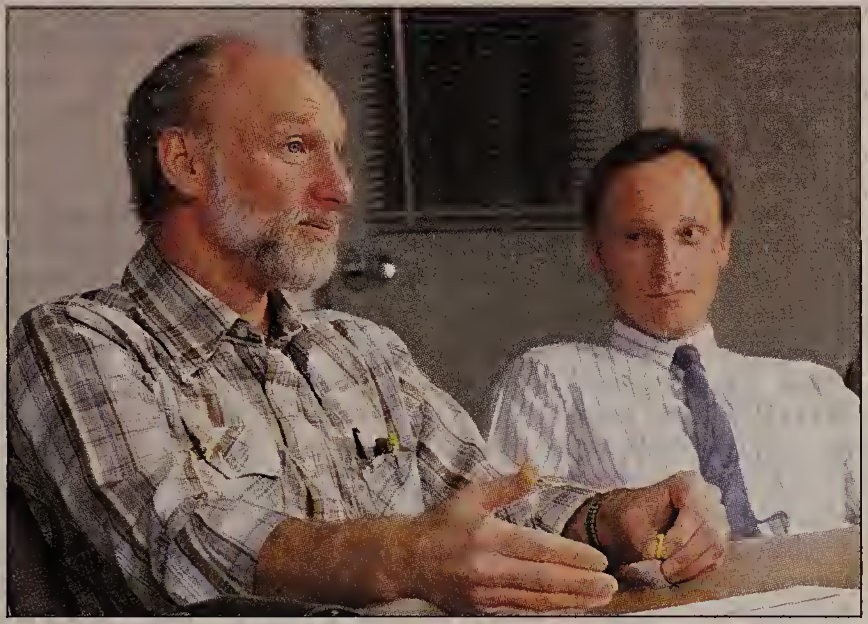

Art Krakowsky and Greg Suski discuss their ISDN experiences.

Lawrence Livermore Labs reflects on ISDN lessons

Project management problems, technical woes among hurdles overcome in building ISDN net.

By Tom Smith
New Products Editor

LIVERMORE, Calif. — With the 12-hour days now mostly behind them, telecommunications staff members at Lawrence Livermore National Laboratory are beginning to reflect on what they've learned from installing a 17,000-line AT&T 5ESS switch that supports more than 8,000 ISDN Basic Rate Interface (BRI) lines.

The 2½-year-long project, which culminated last November when the BRI lines were cut over at the 500-building federal research facility here, taught the laboratory a number of valuable if not painful lessons about Integrated Services Digital Network technology.

Unforeseen problems were encountered in project management, relating to the complexity of migrating a diverse user population to a network based on new technology, and on the technical front, stemming from the relative lack of user and vendor experience with ISDN.

Lawrence Livermore installed

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NCR architects net applications strategy

OCCA will help developers build client/server programs linking workstations to range of servers.

By Jim Brown
Senior Editor

NEW YORK — NCR Corp. last week unveiled an application development architecture that will enable users to write client/server programs linking workstations to processing resources in diverse net environments.

With Open Cooperative Computing Architecture (OCCA), applications on DOS-, OS/2- or Unix-based client workstations will be able to access work group servers or, using those servers as gateways, connect to processors in SNA, OSI, TCP/IP or other networks.

NCR officials said OCCA is a switch from its traditional hardware business and will position the company as an open systems vendor that can provide the software tools needed to link proprietary hardware. Company President Gilbert Williamson said he expects NCR will reap hundreds of millions from sales of OCCA software over the next few years.

The key component of OCCA is Cooperation, an application development tool kit. The initial version of the tool kit, due out in the second half of 1990, will run on DOS and OS/2 workstation clients, as well as OS/2 servers. A version for AT&T Unix System V.4-based clients and servers will be released in early 1991.

The tool kit includes NCR's System Software Platform, which

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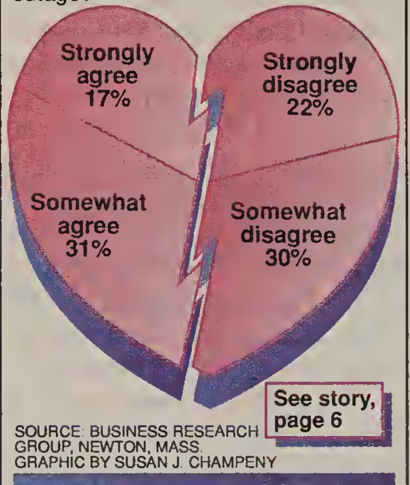
Users split on AT&T's Valentine's Day gift

Was a day of discount calling adequate compensation for the Jan. 15 network outage?



See story, page 6

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.
GRAPHIC BY SUSAN J. CHAMPENEY

NETLINE

USERS GET A SNEAK preview of a new gateway that will tie front-end applications to IBM's DB2. Page 2.

IBM OFFERS RISC-based workstations and servers, which run a new version of AIX. Page 2.

K MART NET UPGRADE integrates voice, data and video, and helps the company improve customer services. Page 2.

NOVELL AND RETIX partner to develop an MHS-to-X.400 gateway for NetWare 386 servers. Page 4.

DREXEL BANKRUPTCY forces legions out of work and shuts down worldwide network. *Network World* offers to hold employee resumes. Page 4.

CLOSER TIES between EDI and X.400 promise to increase the effectiveness and usage of electronic messaging. Page 39.

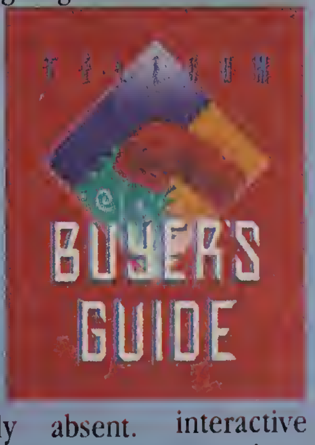
NEWSPAPER

FEATURE

900 services gain respect in corporate strategies

By Daniel Briere
Contributing Editor

As a corporate tool, 900 services are just starting to get off the ground. According to New York-based Strategic Telemedia, 900 services is a $300 million industry today, and by 1992, this figure should near $2 billion.



Until now, business applications of 900 services have been conspicuously absent. Most of the revenues have been generated by consumer-oriented programming, such as sports scores, horoscopes or pornographic taped messages.

Because interactive 900 services have only been on the market since last spring, corporate managers have not had the time to learn how to fit them into corporate telecommunications strategies.

Unlike their passive counterparts, interactive services allow callers to interact with the network

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Firms ready open wiring specification

By Bob Wallace
Senior Editor

TAMPA, Fla. — Users and vendors are meeting here today to put the finishing touches on the industry's first building and campus wiring specifications.

The Commercial Building Wiring Standard and a standard for interbuilding networks called the Commercial Building Standard for Telecommunications Pathways and Spaces define uniform, vendor-independent voice/data wiring systems.

The sorely needed guidelines for cable plant design, which could become U.S. standards by year end, are the culmination of five years' work by the Telecommunications Industry Association (TIA) and the Electronic Industries Association (EIA).

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Networld offers peek at coming Database Gateway

Users can direct a query to SQL Server or DB2.

By Susan Breidenbach
West Coast Bureau Chief

BOSTON — Users and developers at Networld '90 here last week got a peek at a forthcoming gateway product that links desktop applications to IBM's mainframe-based DB2 data base management system.

Developed by Micro Decisionware of Boulder, Colo., the Database Gateway works in conjunction with Microsoft Corp.'s OS/2 SQL Server. From a menu, users of SQL Server front-end applications can direct a query to either SQL Server or DB2.

The gateway can also be used to download DB2 data into SQL Server, or to update mainframe data by doing an upload from SQL Server into DB2. The gateway communicates with the mainframe via IBM's Advanced Program-to-Program Communications/LU 6.2 protocol.

"With this type of product, we're starting to see some truly transparent links to DB2 from the standard LAN environment," said Bill Redman, a vice-president at Gartner Group, Inc., a market research firm in Stamford, Conn. "It will help to speed the delivery of true client/server applications

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IBM's new RISC servers run enhanced version of AIX

By Paul Desmond
Senior Writer

NEW YORK — IBM last week announced a powerful new line of Reduced Instruction Set Computer (RISC)-based Unix workstations and servers and a new version of its AIX operating system that includes network computing and file-sharing features.

IBM's RISC System/6000 family includes nine RISC workstations, five of which are configured as servers that support Ethernet and token-ring nets.

The machines run a new version of AIX with integrated networking facilities including X.25, Transmission Control Protocol/Internet Protocol, Sun Microsystems, Inc.'s Network File System (NFS) and the Network Computing System (NCS) from Hewlett-Packard Co.'s Apollo Systems Division. IBM will support OSI protocols in AIX and offer two graphical interfaces, one of which supports X/Windows.

The IBM announcements were targeted mainly at the scientific and engineering markets, where Unix-based workstations are widely used and where IBM has been lagging behind competitors such as Sun Microsystems, Inc. But IBM said the announcements illustrate its commitment to open

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K mart upgrades national net to fight competitors

New multifaceted network will combine satellite, terrestrial facilities and better customer service.

By Bob Brown
Senior Editor

TROY, Mich. — K mart Corp. is hoping its increasingly sophisticated network will help boost its corporate image.

The giant retailer has taken whacks for its reputation as a purveyor of discount goods — including a slap from Dustin Hoffman's character in the movie "Rain Man" — and has been criticized by some retail industry watchers for lagging behind competitors, such as Wal-Mart Stores, Inc., in its use of network technology.

But the $29 billion retailer is fighting back by signing on high-profile celebrities such as actress Jaclyn Smith to promote new product lines and by expanding and upgrading a multifaceted network that is dedicated to improving customer service.

By the end of the year, K mart will have a voice, data and video network it claims will rival any of its competitors' nets.

"Our senior management understands the mission-critical nature of our computers and network," said David Carlson, the retailer's senior vice-president of corporate information systems in an interview with *Network World* here last week.

By year end, K mart plans to complete installation of the mammoth very small aperture terminal network it began building more than three years ago. It also will have begun migrating

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Briefs

IBM hints at PS/2 Ethernet board. Among the unannounced products IBM was demonstrating in its booth at Networld '90 Boston last week was a 32-bit Ethernet bus master adapter IBM has designed for its Micro Channel Architecture-based Personal System/2s. Novell, Inc. has already supplied IBM with prototype drivers for the board, which was plugged into a souped-up PS/2 Model 80 running NetWare 386.

BELLCORE reaches ISDN milestone. A team of Bell Communications Research technologists last week said they successfully completed the first Integrated Services Digital Network voice/data call between different vendors' central office switches using Signaling System 7.

BELLCORE said the event has advanced the potential for widespread ISDN use. A three-person BELLCORE team, working in the BELLCORE Training and Education Center's multivendor training laboratories, set up and sent simultaneous circuit-switched data and voice between ISDN terminals.

The call was completed by connecting an AT&T Network Systems Group 5ESS switch and a Northern Telecom, Inc. DMS-100 switch through a Digital Switch Corp. signal transfer point using SS7.

E-mail providers form X.500 group. Ten electronic mail service providers last week agreed to form a Directory Services Consortium to expedite development of universally accessible X.500-based interconnected messaging directories.

Western Union Corp. proposed the idea at a January meeting, and attendees had until Feb. 9 to decide whether they wanted to form the X.500 group ("Major E-mail providers plan to form X.500 directory consortium," *NW*, Jan. 29).

In addition to Western Union, founding members include AT&T, Sprint International, BT Tymnet, Inc., GE Information Services, MCI Communications Corp., Pacific Bell, IBM, CNCP Canada and Teleglobe Canada. Infonet is expected to join, as are several other vendors.

Although membership at present is limited to service vendors, the consortium members said they will be attentive to user needs and will look to user groups for input.

Army, du Pont, enlist MCI services. E.I. du Pont de Nemours & Co. and the U.S Army last week signed network deals with MCI Communications Corp. worth a combined $40 million. The du Pont contract, worth $15 million over the next three years, is for 800, Vnet, private lines and calling card services. The contract supplements a five-year, $13.2 million Tariff 12 deal du Pont has with AT&T. The Army contract, bid jointly by MCI and Contel Federal Systems, Inc., is for the Defense Medical Supply System Communications Network. The five-year deal will provide worldwide data communications to more than 400 military facilities in Europe, the U.S., the Caribbean and the Pacific Rim.

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***Network World* wants you.** If you have a news tip, please contact us. We'd also like to hear about unusual network applications and how you're optimizing your networks for performance or savings. Contact Editor John Gallant at (800) 622-1108, ext. 426, or through MCI Mail at 390-4868.

Network World
161 Worcester Road
Framingham, Mass. 01701
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Second-class postage paid at Framingham, Mass., and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World Publishing/Inc., 161 Worcester Road, Framingham, Mass. 01701.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Non-qualified subscribers: $3.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

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POSTMASTER: Send Change of Address to *Network World*, 161 Worcester Road, Framingham, Mass. 01701.

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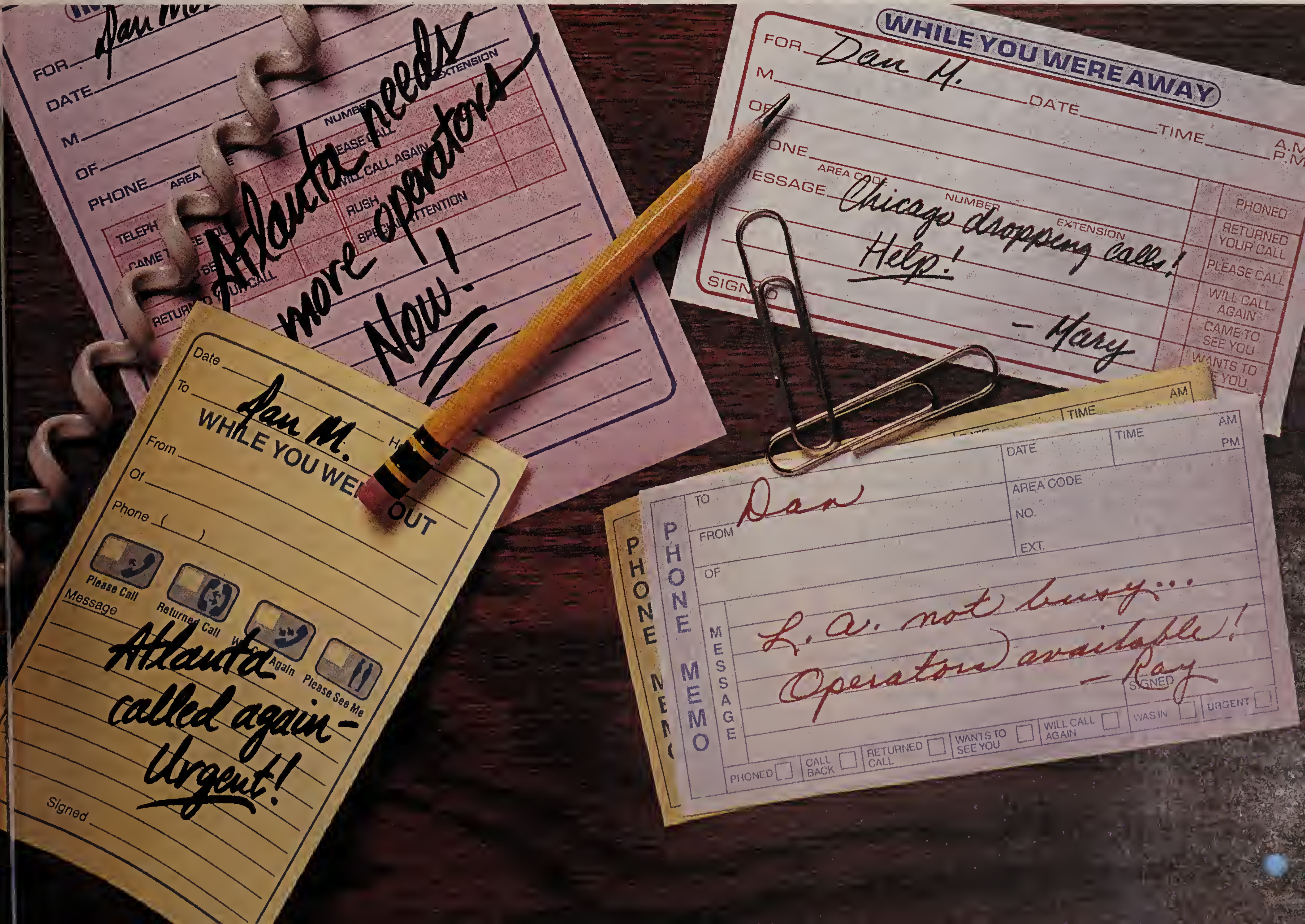
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Drexel downfall puts 500 IS employees out of work

Bankruptcy of the brokerage signals beginning of the end of firm's U.S., worldwide networks.

By Joe Panepinto
Staff Writer

NEW YORK — Drexel Burnham Lambert, Inc.'s dramatic fall into bankruptcy put more than 500 networking and data processing personnel on the streets last week and will lead to the dismantling of the brokerage's U.S. and global networks.

Drexel's decision to seek Chapter 11 protection from creditors was announced last Wednesday after efforts to secure $500 million in loans needed to make short-term interest payments failed. But rather than try to reorganize under Chapter 11, the company decided to dissolve its worldwide operations.

More than 3,500 of Drexel's international work force of 5,300 employees were laid off at the end of last week, and transactions over the company's nets slowed to a trickle as the firm wrapped up remaining business.

Despite the drama of last week's bankruptcy announcement, there had been warning signs of the company's ill health. In April, shortly after being fined $650 million for securities law violations, Drexel announced plans to jettison its retail brokerage operations, removing 43 sites from the national network and cutting 200 information systems (IS) jobs ("Drexel net exec discusses impact of reorganization," *NW*, April 24, 1989).

Most of the remaining 500 IS people were let go last week, but a handful will remain until custom-

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A helping hand for Drexel IS pros

FRAMINGHAM, Mass. — *Network World* is helping information systems (IS) professionals displaced by Drexel Burnham Lambert Group, Inc. last week to find new jobs by providing copies of their resumes to companies seeking experienced network and data processing workers.

Because it isn't clear whether Drexel will offer outplacement services or whether prospective employers will be able to reach workers through the company, top IS executives at Drexel are collecting resumes from laid-off employees and delivering them to our offices here.

The resumes are classified according to the following job functions: network design engineers (voice and data); net technicians/operators; IBM 3270 networking specialists; LAN designers/technicians (token ring); PC software support; site cabling technicians; project analysts; project managers; IBM mainframe capacity planners; market data specialists; service order technicians/writers (voice/data/market data); application programmers (COBOL, DB2, SQL); and systems analysts.

Companies looking for employees in those areas should contact Tracie Seder at (508) 875-6400 or write to *Network World* at 161 Worcester Road, Framingham, Mass. 01710.

Novell, Retix to develop X.400 gateway for NetWare

Software will link MHS applications, X.400 nets.

By Susan Breidenbach
West Coast Bureau Chief

BOSTON — At Networld '90 here last week, Novell, Inc. and Retix, Inc. announced an agreement to jointly develop a NetWare server-based X.400 gateway.

Retix, the nation's leading provider of Open Systems Interconnection protocol software, is turning its Open Server 400 gateway into a NetWare Loadable Module (NLM) that will run as a server-based application in a NetWare 386 server. The X.400 gateway is being integrated tightly with the Message Handling Service (MHS) server Novell is bundling into NetWare 386.

The MHS-X.400 link will enable users on a NetWare local-area network to send messages from applications supporting MHS to an addressee on any X.400 network.

"X.400 is the one near-term technology OSI has to offer the user community," said Steve Spanier, president of Netrends, Inc., a network consultancy in Pleasanton, Calif. "Given the success of MHS as a de facto standard at the desktop, an MHS-to-X.400 link is very useful."

Developed by Action Technologies, Inc. and incorporated into NetWare, MHS — like X.400 — is a store-and-forward technology that enables different applications to communicate with one another. However, MHS is much simpler than X.400, so MHS applications are proliferating much more rapidly than X.400 applications and now total about 45.

The Retix gateway will extend the reach of these MHS products into the realm of global X.400 messaging.

The Open Server 400 for NetWare can also be accessed by native X.400 applications called X.400 User Agents or by applications written to the application program interface (API) developed by the X.400 API Association (APIA).

Richard Goldner, manager of product development for Data Access Corp. and treasurer of the X.400 APIA, applauded the Novell/Retix agreement. "It's tremendously expensive for small companies to create native X.400 products," he said. The API lets those companies rely on a protocol specialist to provide the actual X.400 implementation.

"A lot of us couldn't afford to get into the X.400 market" without the X.400 API and X.400 gateways from third parties, Goldner said. He called the Open Server 400 NLM "the first introduction of a commercial product that implements the X.400 APIA's specification," which was released last summer.

Beginning in April, Retix will offer an X.400 Developer's Workbench that includes a prerelease version of the OpenServer 400 NLM, an X.25 interface board for accessing X.400 backbones on public data networks and software test suites for checking X.400 compliance.

Howard Case, vice-president of marketing for Enable Software, an APIA member, said the gateway and developer's kit should spur development of X.400 applications. As an added incentive, US Sprint Communications Co. later this month is expected to launch a special X.400 developer's program.

According to a company spokesman, US Sprint will offer X.400 application developers a dedicated X.25 link at a very substantial discount plus free X.400 certification testing. There will also be joint marketing, sales and support programs available to further encourage X.400 development activity and speed delivery of applications to users.

US Sprint will also attempt to increase the potential base of X.400 users with promotional X.25 subscriber rates.

Promised AT&T, DG wares make debut at Networld

By Laura DiDio
Senior Editor

BOSTON — The Networld '90 trade show held here last week served up few surprises, but AT&T and Data General Corp. used the forum to make good on last year's promises.

AT&T unveiled its StarGroup Software LAN Manager Server, a Unix-based version of Microsoft Corp.'s OS/2 LAN Manager, while DG took the wraps off its Reduced Instruction Set Computer (RISC)-based implementation of Portable NetWare, called NetWare for AViion Systems.

Both products have been under development for the past year and are scheduled to ship this spring.

AT&T's StarGroup Software LAN Manager Server is multitasking, multiuser local-area network server software based on Microsoft's OS/2 LAN Manager network operating system and incorporating features of AT&T's Unix System V operating system.

The software runs on any AT&T Series 6386 Work Group System as well as Compaq Computer Corp.'s DeskPro 386 25-MHz machines, according to Robert Ziemann, AT&T's product manager for the LAN Manager Server. He said AT&T will certify future releases of LAN Manager Server to run on additional 80386 hardware platforms.

AT&T has integrated the multiuser capabilities, advanced security and wide-area features of its core Unix products into LAN Manager. The product offers full support for file- and print-sharing, as well as remote network administration among MS-DOS, OS/2 and Unix workstations.

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AT&T users keep the faith despite 800 service outage

Crash only affected 200 customers nationwide.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Users of AT&T's 800 service say their confidence in AT&T is not shaken despite a network problem that knocked out 800 service to about 200 customers nationwide.

On Feb. 9, customers with 800 numbers having a 424 prefix lost service for about 90 minutes just after noon. The largest known customer hit by the outage was the Internal Revenue Service, whose two 800 numbers are used to provide tax assistance to the public.

The problem was caused by a network technician who was working on the carrier's signaling network in an effort to balance traffic loads and neglected to enter key information on how to terminate 800 calls.

An AT&T spokeswoman said the company is reviewing its network maintenance procedures to prevent this type of problem in the future. AT&T said that none of the customers affected by the 800 outage qualified for penalty payments under the carrier's 800 Assurance Plan.

The recent outage follows a massive network malfunction in January that cut switched service call completion to 50%. Customers of 800 services were particularly hard hit by that outage. Most rely entirely on AT&T for 800 service, and because 800 numbers can't be transferred from one carrier's network to another's, users had nowhere to turn.

Yet despite two outages in four weeks, 800 customers say they will continue to stick with AT&T.

The IRS uses AT&T exclusively for 800 service, according to a spokesman. Although the IRS believes it may have lost up to 70,000 calls during the 1½-hour outage, it is extremely unlikely that any backup procedure will be put in place, according to an IRS spokesman.

In addition to the significant expense of purchasing backup 800 service, the IRS is unlikely to make any changes to its 800 network because it views the outages as freak accidents, the spokesman said. The agency has used AT&T 800 service since 1972 and this was the first outage it had experienced, he added.

William Cunnane, assistant commissioner of the office of network services at the General Services Administration, which oversees government network services, said administrators have to ask "how many types of diversity can you offer the public and be cost-effective? You can't have total redundancy for that one 'if.' "

Ted Hackmann, manager of telecommunications at Weyerhaeuser Co., based in Tacoma, Wash., said he still has confidence in AT&T and has no plans to work with backup carriers. His company was not affected by the recent 800 outage but did lose service during AT&T's network problem in January.

"You have to realize that you can't prepare for every emergency," he said. "You just try and do what you can within reason."

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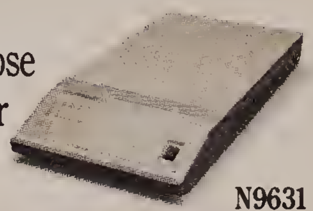

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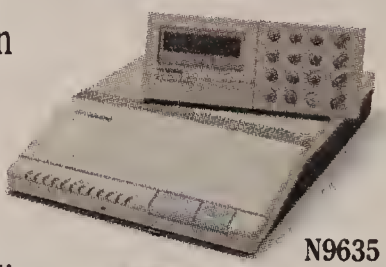

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See the FAXNeT Form on Page #61

C&C Computers and Communications

Aerospace firms mull EDI project

By Bob Brown
Senior Editor

WASHINGTON, D.C. — Members of the Aerospace Industry Association (AIA) last week said they are considering a project that would involve the exchange of electronic data interchange documents between multiple carriers' networks using the X.400 messaging protocol.

By using X.400 to support the transmission of EDI documents, AIA members would be able to route traffic over one carrier's public net to destinations on other public or private nets that also support the messaging protocol.

The proposed pilot program would be a fitting sequel to the AIA's heralded efforts last year to force major U.S. electronic mail service providers to hook up their networks using the international X.400 messaging standard. That project accelerated interconnection agreements between E-mail service vendors that enable users to transmit messages across more than one network.

"An EDI project would be a natural follow up," said Steve Farowich, project manager for AIA's X.400 interconnection pilot and project manager for message handling services at Boeing Computer Services Co. in Bellevue, Wash.

Users are expected to employ X.400 networks to transmit large volumes of EDI traffic, said members of the AIA, a trade association representing the nation's manufacturers of commercial, military and business aircraft, and related equipment. Currently, most X.400 traffic consists of simple E-mail.

Details of the proposed EDI/X.400 pilot have not been worked out yet, and there is no guarantee the project will ever take place, warned an AIA spokesman here. The proposal, which was initiated by members of the AIA's EDI and E-mail panels, will be discussed at a meeting of the AIA Information Technology Committee in early March in Salt Lake City, he said.

It is likely AIA members would use the ANSI X.12 EDI standard format for purchase orders, invoices or other business documents transmitted over X.400 nets as part of the pilot program, AIA members said.

The aerospace companies would expect to receive the typical benefits of EDI, which include eliminating paper, saving on postage costs and reducing errors from rekeying information.

Kenneth Murphy, X.400 product manager for GE Information Services, a Rockville, Md.-based E-mail service provider, said members of the vendor community believe EDI traffic will represent a large portion of the traffic over their nets in the future.

Int'l trade pact provisions could end net restrictions

U.S. revision seeks to bar net access impediments.

By Barton Crockett
Senior Editor

Proposed provisions in a major international trade agreement currently being drafted could help international network users pressure foreign governments to drop restrictive network regulations.

The U.S. has submitted proposals for the new General Agreement on Trade and Tariffs (GATT) that would make it a violation of fair trade for a nation to maintain regulations that prevent a user from having access to network services or equipment required to do business.

Restrictive practices that could fall under this rubric include tariffs for international circuits that far exceed the cost of providing service, technical standards that keep users from employing preferred equipment or network protocols, restricted access to information outside a country's borders, and prohibitions on shared networks and resale of capacity.

If proposed provisions are included in the final version of the treaty, which is expected by December, users would have a powerful tool for battling restrictive carrier practices.

"Nearly every multinational company could take advantage of it," said Ernst Weiss, a director of administration for Data General Corp.'s European operations and European vice-chairman of the London-based International Telecommunications Users Group (INTUG). Weiss has been following GATT negotiations on behalf of INTUG.

Setting the rules

The GATT treaty sets basic international commerce rules for most of the world's industrialized countries. The most recent GATT negotiations began in Uruguay in 1987 and focus on the creation of new rules for intellectual property rights and a more open international services market. Telecommunications is a central part of the services portion of the negotiations.

(continued on page 63)

AT&T's one-day discount didn't make up for crash

Some users may seek additional compensation.

By Joe Panepinto
Staff Writer

NEWTON, Mass. — AT&T's 33% discount on Valentine's Day long-distance calling was not sweet enough to make up for the carrier's devastating nine-hour network outage last month, many large users said last week.

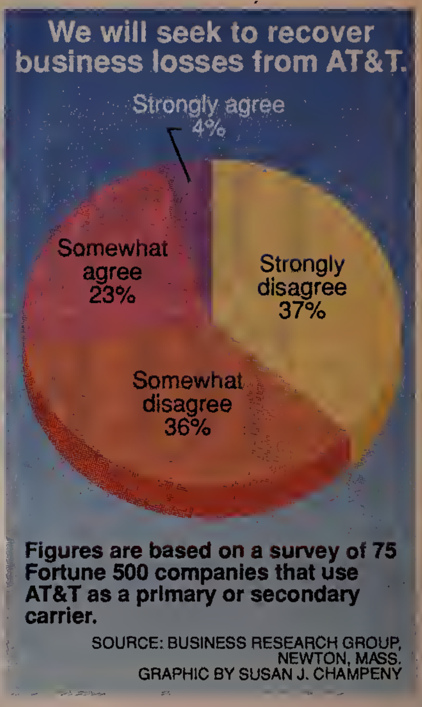
More than half of the 75 Fortune 500 companies responding to a survey conducted by Business Research Group here said AT&T's single-day discount-calling offer was inadequate compensation for the Jan. 15 crash (see graphic, page 1).

Fifty-two percent of the companies responding said they strongly or somewhat disagreed that the Valentine's Day offer was an adequate payback.

Only 17% of the respondents agreed strongly that the AT&T discount offer was enough compensation.

Last month's network failure left AT&T unable to complete about 50% of switched calls. The outage affected the carrier's Dial 1, 800, WATS and Software-Defined Network services.

Despite the disruption to user networks caused by the outage, only 4% of Fortune 500 net managers surveyed said they intend to seek additional compensation for business lost due to the outage, although another 23% said they are considering it (see graphic, this page).



Figures are based on a survey of 75 Fortune 500 companies that use AT&T as a primary or secondary carrier.

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

Users still loyal

The survey also confirmed what many users and observers already believed: The nine-hour outage would cause few companies to leave the nation's largest long-distance carrier ("Net users remaining loyal after AT&T's recent outage," *NW*, Jan. 29).

Almost the entire survey group (96%) agreed that the outage was an isolated event that could happen to any carrier, and 89% said they had no plans to switch to a different primary carrier.

Firms ready open wiring spec

continued from page 1

Companies that have contributed to the development of the standards include American Express Travel Related Services Co. (TRS), Aetna Life & Casualty, 3M Corp., Eastman Kodak Co., General Electric Co. and the Corporation for Open Systems, which has more than a dozen user members.

The Commercial Building Wiring Standard went out to ballot in December. The EIA and TIA are counting ballots now and predict the specification will be approved, according to Peter Bennett, vice-president for the TIA. "We will reconcile any technical issues here," he said. "I'd be surprised if we don't have the standard out by this summer."

Once approved by the EIA and TIA, both standards would be submitted to ANSI for acceptance as national standards, Bennett said.

Building code

The Commercial Building Wiring Standard, which is intended to help users rewire existing structures and cable new buildings, can accommodate buildings with up to 10 million square feet of office space and a maximum of 50,000 employees. The systems are expected to have a useful life of more than 10 years.

The standard addresses horizontal office wiring and the jacks used, wiring closets, backbone wiring, and the placement of intermediate and main distribution frames. The plan for horizontal cabling to the office calls for a minimum of two jacks per office and use of eight-pin modular jacks and standard coaxial cable connectors. Desktop devices can be up to 9.8 feet from a jack.

One of the two jacks will be supported by a cable containing four pairs of 24-gauge 100-ohm unshielded twisted pair, while the second can be supported using one of three types of media: a cable with four pairs of 100-ohm unshielded twisted-pair wire; a cable containing four pairs of 150-ohm shielded twisted-pair wire; or a 50-ohm coaxial cable.

Offices can be wired to telecommunications closets on the same floor at distances up to 295 feet. Multiple closets on each floor can be linked to an intermediate cross-connect distribution frame using 1,640-ft. runs of the same type of unshieleded twisted pair, shielded twisted pair, coaxial cable or fiber.

This media is also used to tie the intermediate cross-connects to the main cross-connect, but at varying distances: Unshielded twisted pair can support distances up to 984 feet; shielded twisted pair can range up to 2,296 feet; coaxial cable up to 1,640 feet; and fiber up to 4,920 feet.

The room housing the main cross-connect must meet all applicable national fire safety codes, except where more stringent requirements apply. The equipment room typically houses switching systems such as private branch exchanges and computer systems. The standard refers users interested in the planning and design of closets and equipment rooms to EIA/TIA-569.

The Commercial Building Standard for Telecommunications Pathways and Spaces was designed to standardize specific design and construction practices for configuring and installing pathways between buildings.

The building standard is intended to offer users an alternative to cabling schemes such as AT&T's Premises Distribution System and IBM's Cabling System, as well as structured wiring systems from companies such as MOD TAP System, AMP, Inc. and Anixter Bros., Inc.

Jonathan Rood, director of communications services for the University of Maryland, examined commercial products from some of these companies and chose a homegrown cabling standard as part of a $32 million campuswide network project that included a massive recabling effort.

"Nobody had written the book on cabling standards, so we wrote our own," Rood recalled. His group put together a cabling specification that borrows pieces of specifications developed by over half a dozen groups. The 30-page booklet was given to the cable contractor as a guide to the college's cable installation plans.

TRS, which has backed the Commercial Building Wiring Standard, has been pushing it as a corporationwide standard for over two years, according to Jerry Gentry, a lead engineer hired to spearhead the drive.

"We've sent a preliminary version to other entities within American Express and strongly recommended it for everyone planning to rewire buildings or cable new ones," Gentry said.

The Commercial Building Wiring Standard is the only way to fly according to Gentry. "I've walked into 10-year-old buildings and seen four different types of [coaxial cable] coming out of a single wall jack," he said. "With [the standard], users will be able to install a single cable plant and be assured most manufacturers will build to it."

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As Global Competition Systems Must Change To

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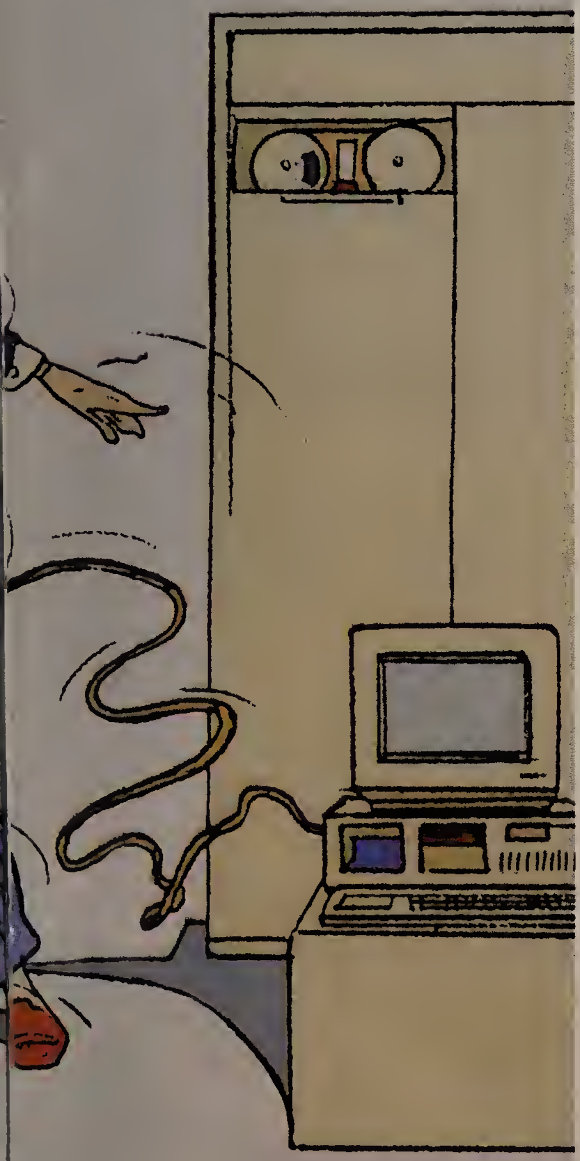
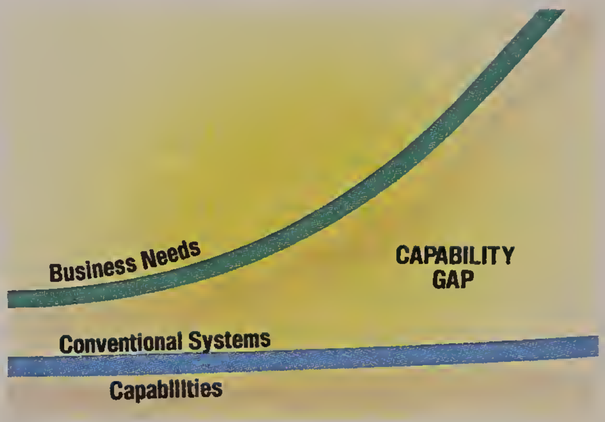


Increasing global competition and growing market expectations are confronting business with accelerating change, change that is reshaping the way businesses operate and compete.



The role of information systems in meeting these business challenges is changing, too, from a service function to a true competitive weapon.

Conventional computing strategies can't provide the capabilities needed for this transition. In fact, the gap between what business needs and what conventional systems can offer is continuing to widen.

Microprocessor-based systems, open networks, and industry-standard software now offer a compelling economic alternative to conventional architectures. But there is a need for a new computing strategy that will transform traditional computing environments.

Such a strategy must deliver several key benefits: An open systems environment that accommodates the widest possible choice of hardware and software.

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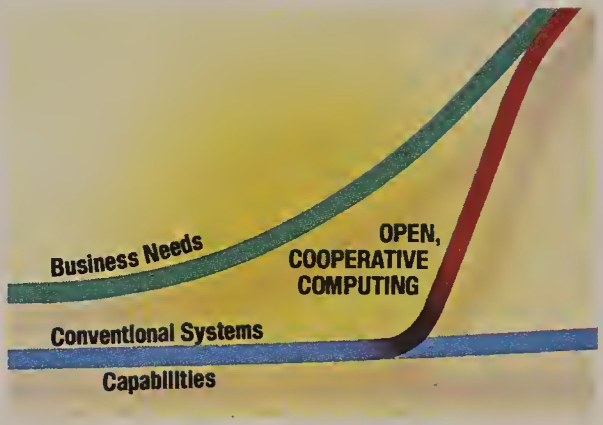

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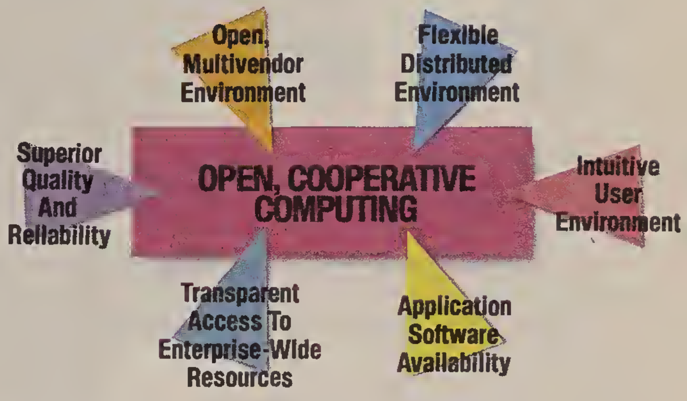
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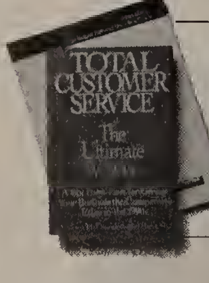

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"To some, ANI seems to be the one big ISDN application. If that's all we were going to do with ISDN, we will have all wasted a lot of money."

Gerard Canavan
Director of enabling technologies
US Sprint Communications Co.
Kansas City, Mo.

People & Positions

Banyan Systems, Inc. last week said it has promoted **K. Wayne Fitzsimmons** to the post of vice-president of international operations at the Westborough, Mass.-based local-area network firm.

In his new role, Fitzsimmons will be responsible for overseeing the management and expansion of Banyan International marketing, sales and support channels. Previously, Fitzsimmons was vice-president for Americas and Far East operations, with responsibility for sales and service operations in Australia, New Zealand, Asia and Latin America.

Martin Mand was recently appointed senior vice-president of finance and chief financial officer of **Northern Telecom, Ltd.**, the Toronto-based telephone switch maker, effective March 1.

Mand is currently vice-president and treasurer at E.I. du Pont de Nemours & Co., where he is a 29-year veteran.

Mand, who will report to Northern Telecom Chief Executive Officer Paul Stern, replaces **Terry Nickerson.** Nickerson was recently appointed executive vice-president of finance and operations for the Northern Telecom World Trade organization.

Howard Graham was recently named vice-president of finance and chief financial officer at **Informix Software, Inc.**, a Menlo Park, Calif.-based maker of distrib-

(continued on page 16)

Vendors set up consortium to test 10Base-T products

Interoperability tests should quell user concerns.

By Bob Brown
Senior Editor

DURHAM, N.H. — A group of local-area network vendors last week formed a consortium to ensure that products based on the draft version of the IEEE 10Base-T standard, for running Ethernet over unshielded twisted-pair wiring, would work together in heterogeneous networks.

While compliance with the 10Base-T specifications should ensure interoperability of multiple vendors' products, the consortium hopes to eliminate any lingering doubts in the minds of users who have experienced other so-called standards-based products that failed to interoperate with one another.

The 10Base-T Consortium, which will be based at the University of New Hampshire (UNH) here, has three major goals: to formalize interoperability testing of products designed under the IEEE 10Base-T specification; to develop and disseminate technical data on proper usage of 10Base-T technology; and to provide a forum for analysis and discussion of 10Base-T once it becomes a standard.

The consortium will formalize independent 10Base-T product testing and evaluation for vendors at the UNH Interoperability Lab.

Use of the lab, which will become functional this month, is accessible only to consortium members.

The consortium's founding members are BICC Data Networks, Inc., Cabletron Systems, Inc., Chipcom Corp., David Systems, Inc., CaSaT Technology, MOD-TAP, NCR Corp., Racal InterLan, Trellis Communications, Ungermann-Bass, Inc. and UNH, the lab operator and only user member so far.

The group wants to attract other 10Base-T vendors such as Digital Equipment Corp., 3Com Corp., Hewlett-Packard Co. and SynOptics Communications, Inc. as well.

"The consortium will perform extensive interoperability testing on available products and offerings still under development and simplify test procedures by reducing organizational overhead," said Barry Reinhold, interoperability lab manager at UNH.

Users are welcome to join the

(continued on page 16)

INDUSTRY BRIEFS

Both the dollar value and number of mergers and acquisitions in the information services and software industry fell more than 15% last year, according to a recent study by industry trade group **Adapso** of Arlington, Va., and **Broadview Associates,** an investment banking firm in Fort Lee, N.J.

Despite the drop in industry mergers and acquisitions, the study predicted the pace of such deals will increase this year.

"In preparation for the European Economic Community of 1992, we will be seeing many such deals in 1990," said Charles Federman, a partner at Broadview Associates.

The dollar value of domestic acquisitions and mergers in the information services industry — which includes companies that offer systems integration, software and processing as well as network-based data base services, training and maintenance — fell 18% in 1989, compared to the year before. Despite 1989's drop to $7.3 billion from $8.9 billion in 1988, the dollar value of transactions was a healthy 49% higher than the $4.9 billion figure reported in 1987.

British Telecommunications PLC in London accounted for one of the year's biggest acquisitions when it shelled out $355 million for **McDonnell Douglas Network Systems Co.,** which included its profitable Tymnet public data network.

As for the 1990 outlook, one of the more positive trends will be that "demand for network-related products and services will intensify as interoperability becomes an imperative for all larger [information technology] suppliers," said Harvey Poppel, a partner at Broadview Associates.

Digital Communications Associates, Inc., in Alpharetta,

(continued on page 16)

(l. to r.): Gerard Canavan, William Allan and Al Lucci

Vendors claim ISDN fate in users' hands

Six proponents of the long-awaited technology offer their insight about its past and its future.

ISDN continues to be the butt of industry jokes (as in "I Still Don't Need"), even though the technology has begun to spawn useful applications, such as automatic number identification (ANI) and call-by-call line selection.

Network World *Senior Editor Bob Brown recently assembled some proponents of Integrated Services Digital Network offerings to find out if they think they will get the last laugh. The panel examined what factors are holding back ISDN applications and whether users are close to realizing the potential of ISDN.*

The panel consisted of Kerry Kniskern, operations manager for communications network services at Dow Jones & Co., Inc. in Princeton, N.J.; Steve Kropper, program manager for ISDN and Intelligent Networks at International Data Corp., a Framingham, Mass.-based market research firm; H. Lee Love Jr., area marketing manager for NetWare products at Novell, Inc.'s Herndon, Va., offices; William Allan, staff director for Nynex Service Co. in White Plains, N.Y.; Gerard Canavan, director of enabling technologies at US Sprint Communications Co. in Kansas City, Mo.; and Al Lucci, president and chief executive officer at Promptus Communications, Inc., a Portsmith, R.I.-based network equipment start-up.

The primary ISDN application we hear users talking about is ANI, but beyond that, we don't see people getting excited about much else. What is holding back ISDN applications?

Lucci: That has always been the thorn: What do we do with ISDN when it finally comes?

I view ISDN more as a tool, and I don't think it's really fair to go to the carriers and say, 'Well, what do I do with ISDN when I finally get it?'

I think the issue with ISDN is making it available. It's a tool, and I think we should let the [users] invent the applications that they want to use over ISDN.

I'm not [preoccupied with] looking at the carriers and saying, 'What am I going to do when you give me ISDN?'

I'm hung up on a different story: Why is it so expensive, and why are the access charges so high? Why are we making it difficult for users to implement ISDN and invent these applications?

Canavan: I always say that the problem with ISDN is the way it's been hyped. It's been marketed all wrong as this end-all technology — that our kids are going to have higher SAT scores because of ISDN, for example.

I'm probably one of the guilty parties because six years ago at [AT&T] Bell Laboratories, we were using this as a great marketing tool when we should have been designing the technology and making sure it was introduced properly.

Probably the biggest problems today are customer perceptions and that [customer premises equipment] needs to be developed to a much greater extent. People have concentrated on ISDN-compatible PBXs, but with PBXs, there isn't even an ANI application if you can't connect that PBX to a host. A seemingly simple application goes way beyond an ISDN-compatible PBX. I think the

(continued on page 16)

ISDN fate in users' hands

continued from page 15

biggest impediments are the high costs of upgrading CPE and the software development.

What role do the regional Bell holding companies play in speeding the emergence of ISDN applications to the market?

Allan: We've got to get the tool out in [the users'] hands. The switched digital network is just three quarters of the acronym. It's the integration part of it — the ability to bring the multiple services together — that is what we see as one of the major advantages of this tool. When users see this integration, they are going to begin to eat up this bandwidth and this capability.

A good analogy, I think, is computers. Who would have ever thought we would have megabyte random-access memory in PCs? Why in the world would anybody ever need that kind of memory?

Well, people have come up with the graphics enhancements and word processing enhancements that have eaten up this memory and put it to good use.

The same thing is going to happen to ISDN as this tool gets in the hands of the users and as the CPE people see that it is more ubiquitously available. They will go ahead and start to develop the CPE, and then this thing is going to start to grow.

Are vendors' messages about ISDN getting across to users?

Kniskern: No. I think users perceive ISDN as a necessary evil, something that is being forced upon them. They really don't understand it, and they don't know what to do with it.

There are some niche products that come out of ISDN — like caller identification — that are good for certain segments of telemarketing, but I think there is not enough information passing from the carriers to the users about ISDN applications. Larger corporations are probably already beyond ISDN, anyway.

Kropper: I think we do have a problem in that the equipment is far too expensive, but the basic rate tariffs that are coming out of the RBHCs are very reasonable. So I'm more concerned with deployment.

We've got to make sure the ISDN sales pitch is on revenue enhancement and productivity enhancements, not on saving telecom costs. I've heard a lot of comments that we can get a 20% reduction on trunking costs because of call-by-call selection.

Well, that's interesting, but the cost of those kinds of access to the total telemarketing center is insignificant, and it's the productivity of the telemarketing agent that is much more important. Users don't think that ISDN is just another piece of bandwidth.

(l. to r.): Steve Kropper and Lee Love

Kniskern: I'm not cynical about ISDN. I think ISDN will have it's place, and I think it will benefit a lot of people. But on the other hand, we're doing switched 56K today, and we don't need ISDN to do that. What ISDN will bring to the table are some standards [for transmission].

Allan: What we're concerned about as local exchange carriers is getting this capability out there to the consumers and to the businesses that can then begin to work with this tool.

Kerry Kniskern

As a local exchange carrier, what we need is the incentive to go forward and make the huge investment that's necessary to do all that. We're looking for the type of regulatory relief that would allow us to clearly know which services — in terms of information services and basic services — we can get into.

Are local-area network vendors pushing for ISDN deployment by the carriers so that more users will start using ISDN applications on their LANs and between LANs?

Love: We've got our own problems to deal with instead of worrying about what I call 'the garden hose.' We don't care what this pipe you give us looks like — just give us the pipe. We'll worry about the other side.

If the carriers provide us with a cost-effective way of getting from Point A to Point B, we would be out pushing that service and saying we can provide interconnection to these kinds of services.

We have our own T-1 board now, for instance, because we want to provide that sort of service.

Canavan: This, again, is where we need application development. One of the big areas we've defined for ISDN is to look at wide area-to-LAN interconnection. What we really want people to do is write an application on a communications server that would automatically monitor wide-area needs across the network and use the out-of-band signaling to set up proper bandwidth connections only when necessary.

Can users expect to see substantial progress with ISDN application development this year, or could we possibly wind up back here again a year from now having the same discussion?

Kropper: I'm pretty enthusiastic about the state we're in. It's like a rainbow — when you're in the middle of the rainbow, you don't realize it's there. But when you stand back and look at it, you can clearly see it.

The same thing is true with ISDN rollout. By next year, we'll have [IEEE] 802.6 trials, which are the Bell companies' metropolitan-area network trials. We'll have the Basic Rate from all the RBHCs by year end, and we'll have the Primary Rate from all the major long-distance carriers. That's substantial progress.

Canavan: I think you'll have to give it a two-year time frame because we'll just be starting to have Signaling System 7 connections with the RBHCs at the end of next year, and I think it is going to take a little time to spur the whole data community into developing applications.

This year, we'll still be in an introductory-type period. The only thing taking off is the telemarketing and ANI applications, and in some cases, that's good and bad. It's good because it's the perfect application for ISDN, but the bad part about it is that too many people are focusing on just that. So a lot of people are walking away from the technology saying, 'I don't need ANI.'

Kniskern: Two years is a long time. I can tell you now you're going to see some dramatic changes in those two years while you're trying to get this thing off the floor. That's why ISDN has got to be rolled out now.

Industry Briefs

continued from page 15

Ga., last week agreed to acquire **Pacific Data Products, Inc.**, a San Diego-based maker of laser printer enhancement products, for about $77 million.

Pacific Data Products is a privately held firm that makes software cartridges and memory expansion boards that upgrade the capabilities and performance of Hewlett-Packard Co.'s and other vendors' laser printers.

The acquisition is expected to let DCA build products that offer increased printing capabilities for personal computer users on local-area networks, according to a DCA spokeswoman.

DCA, which recently sold off its wide-area network business to Racal Electronics PLC in order to focus better on its personal computer connectivity business, said it plans to make Pacific Data Products a wholly owned subsidiary.

Alloy Computer Products, Inc., in Marlborough, Mass., recently launched a program designed to recruit vendors of vertical market software programs to certify product compatibility with Alloy's 386/MultiWare system — a multiuser, multitasking MS-DOS-based offering.

The Alloy Vertical Solutions Program was created to increase the availability of software programs based on 386/Multiware in a variety of vertical markets, including the accounting, retail and medical fields.

The program lets software vendors evaluate a 386/MultiWare system for 30 days to assess or verify product compatibility. Alloy's 386/Multiware lets up to 21 users on terminals and personal computers share a host Intel Corp. 80386-based personal computer.

Vendors set up consortium

continued from page 15

consortium, but the group is expected to remain largely composed of vendors, Reinhold said. One reason for this is that companies must pay a $3,500 membership fee, something that many user organizations have been reluctant to do in the past.

From a user's point of view, Reinhold said he hopes the consortium's efforts will spur the availability of interoperable products since vendors can spend more time testing products, rather than creating test suites for them. The lab is also expected to give UNH students a chance to familiarize themselves with the technology, he said.

Plans are in the works to form other networking company consortia for product testing in the lab, Reinhold said. Possibilities include a Fiber Distributed Data Interface group.

People & Positions

continued from page 15

uted data base management systems.

Graham will report to Phil White, Informix's chief executive officer. He replaces Wynne Jennings, who was recently named vice-president of operations for Informix.

Previously, Graham served as senior vice-president of finance and administration and chief financial officer for Wyse Technology, Inc. in San Jose, Calif.

Apple Computer, Inc. recently named **Soren Olsson** as president of **Apple Computer Europe, Inc.**

In his new position, Olsson will be responsible for Apple's marketing, sales and support operations throughout Europe, Africa and the Middle East.

Previously, Olsson was vice-president and managing director of Apple's operations in Sweden. He also served as general manager for the company's Europe North sales region, which includes Norway, Denmark, Finland, Iceland, West Germany, Austria and the Eastern European countries.

Olsson replaces Michael Spindler, who was recently named the firm's chief operating officer and executive vice-president. Olsson will report directly to Spindler.

Worth Noting

Octel Communications Corp. recently integrated its Aspen voice-processing systems with AT&T's Definity Generic 1, 2 and System 25 PBXs. With integration, the switch passes unanswered calls and calls to busy lines to voice mail. When a message is left, it lights the message-waiting lamp on the user's telephone set.

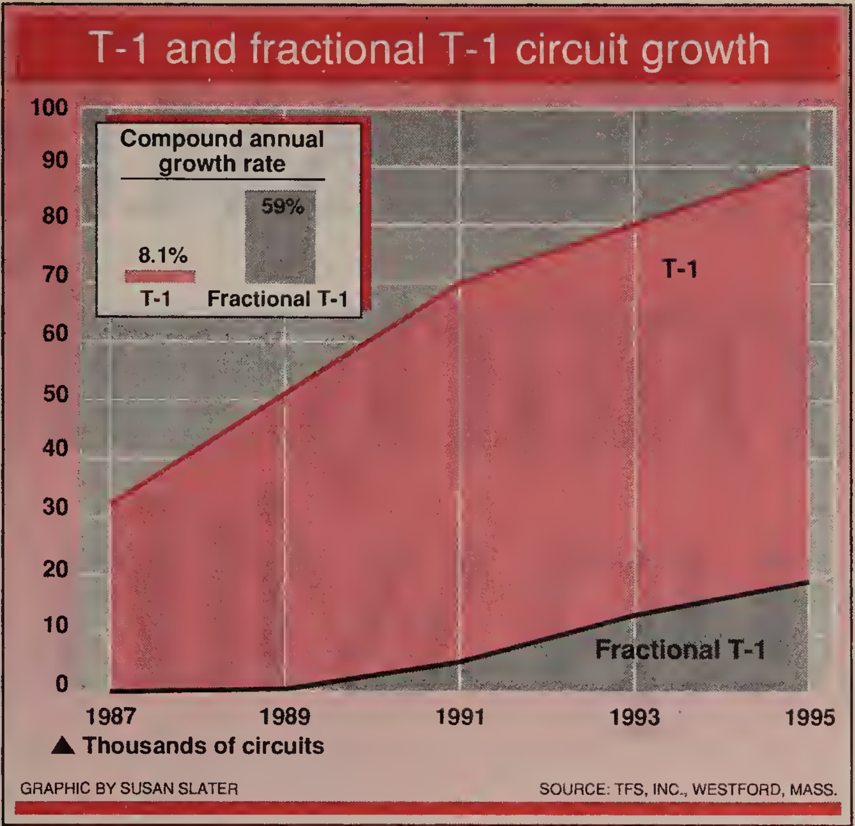
Carrier Watch

In a filing with the Federal Communications Commission last week, **US West Communications, Inc.** cut prices for its 45M bit/sec offering by an average of 6% and added new payment plan options. If approved, the changes will take effect March 31. Currently, US West DS-3 Service customers buy the service on a monthly basis or sign a three-, five- or 10-year contract. The carrier has proposed adding one- and two-year options.

United Telecommunications, Inc. of Kansas City, Mo., recently said that its local telephone companies added 160,000 access lines in 1989 to bring its total to date to almost four million lines. The company said long-distance call volume in its local operations grew 12.5% in 1989.

Metropolitan Fiber Systems of Chicago, Inc., a fiber bypass carrier, recently began providing alternate access service to **Consolidated Network, Inc. (CNI)**, a regional fiber carrier based in St. Louis. CNI provides a variety of private-line services to users and carriers in the Midwestern portion of the U.S. and is a founding member of a consortium of carriers known as the National Telecommunications Network.

T-1 and fractional T-1 circuit growth



GRAPHIC BY SUSAN SLATER

SOURCE: TFS, INC., WESTFORD, MASS.

AT&T offers PBX wares, enhancements at ComNet

Call-routing options, call center products top bill.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — AT&T unveiled a raft of private branch exchange enhancements and products at the recent Communication Networks '90 conference here, including new call-routing options and call center programs.

In the call-routing category, the company introduced Look Ahead Interflow, an advanced 800 call-handling feature for AT&T System 85 and Definity PBXs that makes it possible to route incoming calls to agents at any of several sites.

Customer switches have to be equipped with Integrated Services Digital Network Primary Rate Interface (PRI) software and must be supported by PRI lines.

When all agents at a main reservation center are busy, incoming calls can be held in queue while the switch uses the D channel of the ISDN PRI link to query a second PBX about agent availability.

"But the call is only routed to the second site if there's an agent available there," said Ernie DeNigris, vice-president of product management and communications systems for AT&T.

Days Inns of America, Inc., the first user to trial Look Ahead Interflow, said the feature, used in conjunction with automatic number identification, has enabled the 700 agents at its reservation centers in Atlanta and Knoxville, Tenn., to answer more calls in less time.

AT&T charges users a onetime $2,000 fee to activate Look Ahead Interflow.

A second routing feature, Selective International Routing, is a Definity Generic 2 switch software option that enables the switch to examine the digits dialed after an international direct distance dialing code and to route the call over dedicated lines, public facilities or a combination of the two.

AT&T also introduced products designed for use in call center applications.

Basic Call Management System (BCMS) is a Definity Generic 1 software feature that collects and processes information and generates reports when the switch is supporting automatic call distribution (ACD).

Because it runs on the Definity Generic 1's main processor, an adjunct processor is not needed.

BCMS is designed for users with small call centers of up to 30 agents and 400 trunks distributed among 30 trunk groups. Larger call centers require an AT&T 3B minicomputer-based call management system.

BCMS organizes agent performance data, call processing statistics and trunk usage information into any of 10 reports. Reports cover things such as the number of calls handled by an individual agent or groups of agents and average call duration.

BCMS includes a Report Scheduler, which enables the user to program the system to generate one or more reports at a preset time. BCMS is available now for $3,500, which includes the Report Scheduler.

(continued on page 20)

Regulators brace for busy '90 season

Legislators, agencies set to tackle issues such as price caps and long-haul market competition.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The year in telecommunications looks like it will be a stormy one as legislators and regulators gear up to tackle several long-standing, thorny issues.

Officials from the Federal Communications Commission, speaking at the recent Communication Networks '90 conference here, said that during March alone, the agency will make public recommendations on two of the most controversial issues pending.

The FCC will issue a proposal asserting that segments of the long-distance market are highly competitive and suggesting how the regulation of AT&T might be changed in response to this competition. FCC officials also said the commission will issue a revised proposal for extending price cap regulation to local exchange carriers.

In addition to these two proceedings, the FCC is likely to be drawn into the fierce debate on whether the Modified Final Judgment restrictions barring the RBHCs from information services, manufacturing and long distance should be lifted.

Earlier this month, Rep. Edward Markey (D-Mass.) released a draft version of a bill he plans to introduce that would relax these restrictions and give the FCC some oversight responsibility for the Modified Final Judgment.

Drawing the line

In the long-distance arena, the FCC plans to release a set of new rules governing the interexchange industry. Until now, critics have complained that the agency has been setting policy on a piecemeal basis, reacting to the maneuvering of carriers, rather than leading the way as markets change.

FCC Commissioner Sherrie Marshall said it is clear to the FCC that AT&T faces stiff competition in some markets.

The proposal will examine issues such as market share and whether AT&T should continue to be regulated as the dominant

(continued on page 20)

WASHINGTON UPDATE

BY ANITA TAFF

Rivals cry foul on AT&T's SDN discount plans. AT&T last week came under fire for a recent proposal to allow Software-Defined Network (SDN) customers to include their 800 traffic under SDN volume discount plans. AT&T said customers are demanding unified discount plans and that it must offer such a plan in order to remain competitive. MCI Communications Corp. and US Sprint Communications Co. asked the FCC to reject the AT&T proposal, claiming it is unlawful. Both said AT&T is attempting to use its dominance in the 800 market to lock in customers for its SDN service.

AT&T moves to raise private-line prices. AT&T last week filed a proposal with the Federal Communications Commission to raise prices on some of its digital and voice-grade private-line services. AT&T said that effective Feb. 26, it plans to raise the central office connection charges on 9.6K, 56K and 64K bit/sec Accunet Spectrum of Digital Services, and voice-grade private lines. Rates for these services will rise to $20 from $16.40 per month. AT&T will also raise central office connection charges for its Dataphone Digital Service from $16.40 to $20 per month on line speeds between 2,400 bit/sec and 19.2K bit/sec. The charge for 56K bit/sec Dataphone Digital Service connections will increase from $45.40 to $50 per month. AT&T plans to raise monthly recurring charges for interoffice channels on its 2,400 and 4.8K bit/sec Dataphone Digital Service between 50% and 100%, depending on the mileage band. Per-mile costs will stay at $2.84. Increases for interoffice channels on the 4.8K bit/sec Dataphone Digital Service will vary between 50% and 6%, depending on mileage.

While MCI® was "swe
ratings, many of their
signing up with AT&T.

Virtual Network Features	AT&T SDN	MCI Vnet℠
Dedicated virtual network Control Center where each customer is assigned a full-time representative.	YES	NO
Advanced network management tool to analyze and reconfigure your network as your needs evolve.	YES	NO
On-line network management capability to test line transmission levels and retrieve results.	YES	NO
Remote Access capabilities that provide you with your own distinct 800 number to access your network.	YES	NO
Partitioned Database Management that enables your subsidiaries to manage their own subnetworks.	YES	NO
Switch digital routing at 56 kbps for high-speed data applications, such as video teleconferencing.	YES	NO
EDI electronic bill delivery.	YES	NO
Full implementation of Primary Rate Interface and ISDN.	YES	NO
Virtual network Users Group where customers provide input for future product development.	YES	NO

*Customers signed up from various MCI services.
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eping” the research customers were

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Users groups give managers voice in regulatory affairs

By Joe Panepinto
Staff Writer

Users groups are playing an increasingly vital role in providing net managers a voice in regulatory proceedings that can influence their long-term strategic network decisions.

Changes in regulatory policies regarding tariffs and taxation can open windows of opportunity for the informed net manager, or they can slam the door on those caught napping or locked into long-range planning cycles ("Strategic planning vital to success in changing times," *NW,* Feb. 12).

Network managers, unnerved by the constantly shifting regulatory landscape, look to users groups for help in bringing their shared concerns before public policy commissions.

"It's crazy out there," said Sam Stafford, director of corporate telecommunications at Supermarkets General Corp. in Woodbridge, N.J. "You think you have the best deal in town, and two days later, you see someone else has a better deal."

To stay on top of the marketplace, Stafford augments his own regulatory research with monthly newsletters distributed by the International Communications Association (ICA).

In addition to monthly reports on national regulatory policy, statewide regulatory reports are prepared by ICA committees and circulated among members in each state. The Tele-Communications Association, Inc. (TCA) does the same for its members.

"It's vital that users stay current in the regulatory scene," said Leonard Evenchik, director of communications for the Commonwealth of Massachusetts. "You have to stay up-to-date. Otherwise, you get blindsided."

Evenchik gathers information from the National Association for State Telecommunications Directors and informal relationships with public policy groups at the Massachusetts Institute of Technology and Harvard University. He also spends a significant amount of personal time tracking regulatory policy.

> "You have to stay up-to-date. Otherwise, you get blindsided," Evenchik said.

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Jerald Marcone, first vice-president of the New York-based Communications Managers Association (CMA), said his group also distributes a monthly newsletter in order to keep CMA members informed on national, and many local, regulatory issues.

"Small companies that aren't in a group like ours, unless they're dealing with consultants or have friends in big companies, are getting their information after-the-fact from newspapers and television," Marcone said.

But even the most accurate media reports are inadequate because they simply keep users informed and do not offer a way for them to participate in regulatory proceedings, said George Sparks, manager of telecommunications planning at Baxter Healthcare Corp. and an officer on the Telecommunications Public Policy Committee of the ICA.

"Your really big companies are very active in Washington, D.C. every day of the year," Sparks said. "When you join an association, there is a chance to leverage a $500 membership into $100,000 of lobbying power."

The ability to influence, as well as to understand and react to, changes in regulatory policies are as central to ensuring cost-efficient telecommunications networks as the selection of a vendor or configuration, users concurred.

Most users groups retain full-time legal counsel in Washington. Those counsels follow the intricacies of regulatory policy-making and testify on behalf of their respective memberships at appropriate regulatory hearings.

In that way, membership in a users group can offer small users some of the same advantages enjoyed by large companies that have the resources to dedicate an individual or entire department exclusively to following and influencing regulatory proceedings.

Bill Moore, chairman of the TCA government liaison committee, said his group has given testimony repeatedly in the Federal Communications Commission's two-year proceedings on price caps. "Certainly the customers have to be involved through organizations to influence the regulatory process," Moore said.

AT&T offers PBX wares at ComNet

continued from page 17

Another new call center software feature is Names Registration, a Definity Generic 1 software option that enables hotels, motels and hospitals to offer guests personalized telephone services. When guests check in, their name and room number are entered into the property management system and forwarded to the Definity Generic 1. When guests call within the hotel, the staff will be able to use voice terminals equipped with a display to identify them.

AT&T's Ernie DeNigris

Names Registration is available now and is included in the price of the Definity Generic 1.

"Clearly, the emphasis with these new capabilities is on vertical industries," said Curtis Weeks, AT&T vice-president of product management and system peripherals.

AT&T also expanded Manager III — the Definity Generic 2 switch management system that runs on an AT&T 6386E/33 Work Group System minicomputer — to work with its System 85 and Dimension PBXs.

Manager III supports three modes of operations: Task Mode, Enhanced Mode and Basic Mode. The Task Mode enables nonskilled staff to perform 12 routine PBX administration tasks, including moving, adding and changing telephone stations and switch trunks.

Task Mode presents the user with a series of fill-in-the-blank screens designed to minimize the time required for these basic functions. With Enhanced Mode, which is designed for use by traffic engineers and network managers, users can perform a series of less frequent PBX administration tasks, such as rearranging trunks and changing the size of trunk groups. The Basic Mode is designed for users who manage PBX networks consisting of the Definity Generic 2, System 85 and Dimension PBXs. Users with such networks would likely use Task Mode to administer the Definity and Basic Mode for the other switches in the network.

Originally announced over a year ago, Manager III will become available in the second quarter of this year.

AT&T's Curtis Weeks

The software is priced at $10,000 for the first switch administered, $8,000 for each additional Definity Generic 2, and $2,000 for each System 85 or Dimension PBX.

Regulators brace for busy season

continued from page 17

carrier in all segments.

Marshall did not detail the direction the FCC might take in this proceeding, but she did acknowledge "the notice of proposed rule-making will better reflect marketplace realities."

The FCC will use the proceeding to put to rest questions about the legality of custom network deals under Tariff 12, 15 and 16 as well, according to Cindy Schonhaut, legal adviser for FCC Commissioner Andrew Barrett.

"It is clear to me that these offerings raise significant legal issues regarding the obligations and rights of AT&T, which is now considered the only dominant interexchange carrier," Schonhaut said.

When the FCC rules on whether AT&T should continue to be treated as a dominant carrier for all market segments, "that will definitely affect the ability of AT&T to offer these specialized tariff offerings," she said.

Marshall told attendees at ComNet that the FCC will also tackle the local exchange price cap issue at the March meeting by issuing a revised version of its price cap plan that reexamines one of the central features of the plan, the productivity factor.

Savings guaranteed

The FCC claims that this mechanism, which requires the RBHCs to hold future rate increases at 3% below the rate of inflation, will guarantee consumer savings.

Opponents say that due to network improvements during the last few years, the RBHCs' costs are declining and they should be able to hold price increases 5% to 10% below the rate of inflation. If the productivity factor isn't increased, carriers will earn excessive profits, critics say.

Marshall said the new price cap proposal will also examine an automatic stabilizer, which will adjust RBHC prices downward if their profits become too high.

Dan Kelley, director of regulatory policy at MCI Communications Corp., is one of those who believe price cap regulation for the RBHCs will bring higher prices. The long-distance carriers are the largest customers of the RBHCs' interstate access services, the biggest category of services covered by the FCC plan.

"If we believed that access charges would be lower under price cap [regulation], we would be its most litigious and ardent advocate," Kelley said. But so far, nothing has been presented to convince MCI that giving the RBHCs more pricing freedom will result in lower rates, he said.

> "With price caps, the situation is heads, the BOCs win; tails, the consumers lose."

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Kelley pointed out that a number of carriers and users groups are united in opposition to price cap regulation. "What we have under price caps is a situation where heads, the BOCs win; tails, the consumers lose," he said.

Brian Moir, counsel for the International Communications Association, said users are concerned about price cap regulation on two broad fronts. They are concerned that the plan is flawed and will result in higher prices, and they fear the FCC may not have adequate resources to properly oversee the plan, he said.

"Invariably, we have FCC principals making decisions that are basically going to be unworkable because they don't have the staff and resources to implement that set of rules," Moir said.

However, Michael Wack, senior legal advisor to the chief of the FCC Common Carrier Bureau, said the price cap plan will help the agency more effectively track the activities of the carriers.

Rate-of-return regulation, which sets a limit on the profit levels of carriers through a complicated analysis of carrier costs, "requires an army to enforce," Wack said. The Common Carrier Bureau, which oversees carriers' tariff and rate filings, has 300 members to monitor the activities of more than 1,400 local telephone companies and hundreds of long-distance carriers, he said.

Under the current regulation, "a bunch of lawyers and economists in Washington are second-guessing the way business decisions are made [by the carriers]," Wack said. "It's a nightmare of inefficiency."

Price cap regulation, which sets limits on the prices carriers can charge but doesn't restrict profit levels, is viewed by the FCC as an easier system to administer and one that will give carriers an incentive to be more efficient and innovative, he said.

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

> "There's some things that we need to roll out this year. One would be some more support of voice/data integration. Another one would be a major emphasis on OSI. Another would be a major emphasis on TCP/IP."
>
> **Ellen Hancock**
> Vice-president and general manager of communications systems for IBM speaking at Communication Networks '90
> Washington, D.C.

Data Packets

Newbridge Networks Corp. recently announced two local-area network bridges that are integrated with the company's 3600 MainStreet T-1 multiplexers. The bridges are based on Newbridge's communications processor cards, which fit into its MainStreet multiplexers to provide access to the multiplexer's backplane.

The new bridges are the company's first and, Newbridge claims, the industry's first to be integrated with a T-1 multiplexer. Because the bridges are integrated with the MainStreet multiplexers, they take advantage of the multiplexer's redundancy, rerouting and management features.

The first new bridge, the 3203 MainStreet, is an IEEE 802.3 Ethernet media access control-layer bridge that supports a total trunk speed of 2.048M bit/sec. That bandwidth can be divided into as many as 30 channels, each of which can terminate on a different MainStreet node.

The firm's other new bridge, the 3205 MainStreet, offers the same features as the 3203 but for IEEE 802.5 4M and 16M bit/sec token rings.

The bridges will be available by July. The 3203 will cost about $7,000, and the 3205 will cost $7,500. Both prices include the communications processor card. ◼

AT&T displays Accumaster Integrator net mgm't skills

AT&T shows system's multivendor net capabilities.

By Paul Desmond
Senior Writer

WASHINGTON, D.C. — At the recent Communication Networks '90 show here, AT&T showcased its Accumaster Integrator net management system in a simulated demonstration of its multivendor net management capabilities.

AT&T showed Accumaster Integrator monitoring and controlling a number of its own net management systems, as well as an array of third-party net management tools from vendors including Cincom Systems, Inc., Infotron Systems Corp., Digital Communications Associates, Inc., Racal-Milgo and Newbridge Networks Corp.

In addition, Accumaster Integrator was shown monitoring and controlling AT&T's Trouble Tracker private branch exchange management system; Accunet Information Manager, which collects extended superframe format data from T-1 links; Starkeeper, which controls AT&T's Datakit and Information System Network packet switches; Routing Control System, which lets users reroute Megacom 800 lines; and a Tridom very small aperture terminal management system. AT&T owns Tridom.

Accumaster Integrator also supported terminal-emulation windows to access AT&T's Software-Defined Network Management System and its Direct Access Trunk Test System, which tests lines between a user's site and an AT&T point of presence.

The demonstration was located just across the aisle from IBM's NetView demonstration, which differed from AT&T's in that it was live, whereas AT&T's was driven by simulation software ("IBM NetView demo touts flexibility," *NW,* Feb. 12).

Still, users were generally impressed with the Accumaster Integrator demonstration, although some balked at the $275,000 price tag for a low-end configuration.

"It looks very good," said Leonard Frye, data communications network manager at Central Fidelity Banks, Inc. in Lynchburg, Va.

But he still had one concern: "I don't know what the price tag

(continued on page 24)

Bankers Trust says its LAN will raise trading efficiency

By Joe Panepinto
Staff Writer

LONDON — Bankers Trust Co. last week unveiled a DECnet-based local-area network at the core of a new digital trading room it believes will become a standard in the financial services field.

The new trading system, designed jointly by Bankers Trust and Digital Equipment Corp., allows traders at 250 VAXstation 3100-based workstations to simultaneously access, manipulate and save real-time financial information from six financial pricing services.

In the old video environment, traders had to copy information from a constantly scrolling screen to capture information being fed to each terminal by financial information services such as Quotron Systems, Inc. and Reuters Information Service, Inc.

Eventually, Bankers Trust plans to route pricing information from outside services directly into an analytical software package at each workstation. That would give each trader the ability to spot market trends quickly for use in on-the-spot sale and purchase decisions, a Bankers Trust spokesman said.

Geoff Penney, manager of technological strategic planning for Bankers Trust, said the digital technology will allow the company to fully integrate real-time market information into an analytic system that would make portfolio management easier and more efficient.

In addition to increasing trader efficiency, the move would reduce operating costs, Penney said.

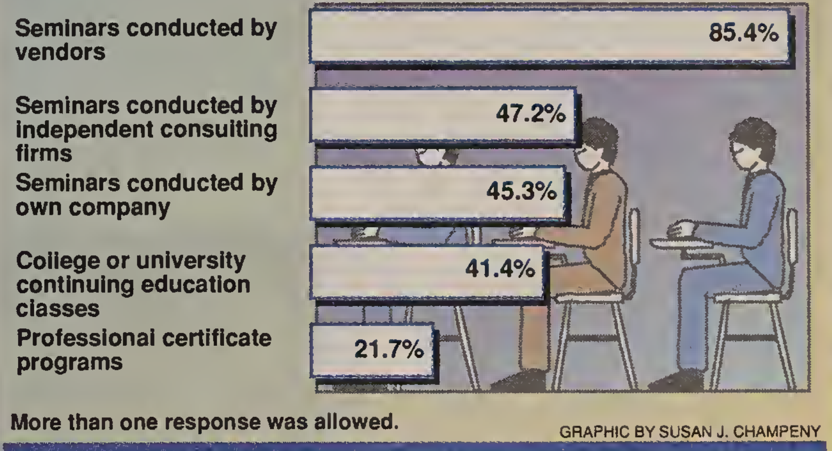
The bank's migration to the DECnet LAN underscores a growing commitment by financial institutions and brokerage houses to digital trading centers, according to Thomas Festa, vice-president of communications services at Third Generation Brokers Corp. and president of the Wall Street Telecommunications Users Group.

"I think it's the kind of thing everyone is experimenting with because it's the wave of the future," Festa said. "Everyone on

(continued on page 24)

Preferred training methods

Network World asked 775 networking professionals to indicate the types of data communications training they had received.



More than one response was allowed.

GRAPHIC BY SUSAN J. CHAMPENY

Bank builds X.25 net to end traffic crunch

X.25 backbone will link 180 branches and permit bank to migrate to distributed processing setup.

By Jim Brown
Senior Editor

PORTLAND, Ore. — First Interstate Bank of Oregon last week said it is building an X.25 backbone that will link its branches to a data center here and position the bank to migrate from a hierarchical, terminal-based network to a distributed processing architecture.

In the short-term, the X.25 packet-switched backbone will enable the bank to improve terminal response time and expand network capacity. The backbone will also complement First Interstate's disaster recovery plan.

The packet-switched network initially will link the bank's 180 branches to any of a half-dozen X.25 packet switches across the state. The switches will then forward the data over 56K bit/sec circuits to a data center here.

Eventually, the X.25 network will position the bank to migrate to a distributed processing architecture now under development, in which minicomputers and local-area networks in each branch will handle local processing chores and shuttle data to the host on an as-needed basis instead of maintaining constant contact. This architecture will enable the bank to move transaction processing from the host data center to the branch locations.

"We will probably migrate over the next several years to some sort of branch processor," said Thomas Finley, vice-president of network services at the bank. "We'd like to put some additional banking application type of intelligence on that kind of processor."

In the meantime, the new packet-switched backbone will replace the bank's overburdened 4.8K bit/sec analog leased lines, which support Synchronous Data Link Control traffic between the host and branch devices.

The bank intends to improve response time to each branch by off-loading host-to-terminal polling chores from the host to an in-branch computer. Currently, host-issued polling signals clutter the 4.8K bit/sec circuits to each branch.

"The analog circuits have been saturated with polling, which leaves little room for real production data," Finley said.

> The new backbone will replace the bank's overburdened 4.8K bit/sec analog lines.

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To eliminate polling from the network, the bank is installing Sync Research, Inc. X.25 packet assembler/disassemblers, called Network Access Controllers (NAC), in each branch.

In addition to providing access to the X.25 net for up to 20 devices, the NACs will use the SDLC protocol to poll branch devices locally, thus freeing backbone bandwidth for other data.

The bank is also installing OST, Inc. X.25 switches in six locations. These switches will be interconnected via 56K bit/sec digital data links. Each branch will be linked in point-to-point fashion

(continued on page 24)

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See the FAXNeT Form on Page #61

Bank builds net to end crunch

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to the nearest switch via leased digital circuits operating from 4.8K bit/sec to 56K bit/sec.

Currently, up to eight branch terminals, ATMs or other devices are linked to a modem-sharing unit, which enables multiple devices to share a single 4.8K bit/sec circuit to the data center.

With the NACs, SDLC traffic from branches will be converted to X.25 format and forwarded across the network to the nearest switch. That switch will route it to an IBM 3745 front-end processor running IBM's Network Control Program Packet-Switching Interface (NPSI) software at the data center. NPSI converts the X.25 packets back to SDLC and forwards the SDLC data to an IBM 3090 host for processing.

In a pilot test linking four branches to the data center, the X.25 network has noticeably improved response times, Finley said, although it is too early to cite exact improvements since his staff is reviewing benchmark results. The bank's target is to achieve a 3.5-sec response time for most transactions.

Finley said he expects 80 branches to be linked to the net by the end of June and the rest to be added by 1991.

The X.25 network also complements the bank's disaster recovery strategy, which is called the Business Resumption Plan. The X.25 backbone will create a mesh network in which each packet switch is connected to at least two other remote X.25 switches. This configuration provides an alternative path should one switch fail.

In addition, each switch is capable of establishing a dial-up link to a functioning switch should a failure occur in both the switches to which it is connected. This strategy complements X.25's inherent ability to automatically reroute traffic around failed lines. ◼

Bankers Trust touts its LAN

continued from page 21

Wall Street who's looking at systems right now is looking at digital systems. It gives them better manageability of information."

Festa said many industry analysts will be watching Bankers Trust as it moves to a fully implemented digital trading room.

The system, though based on DEC's highly-touted DECtrade software for the financial industry, falls short of full digital implementation because it does not support on-line analysis, according to Corey Bock, executive editor of "Trading Systems Technology," a specialty financial technology newsletter based in New York.

The system allows traders only to cut and paste information in four different sectors of the screen for more efficient display, he said.

By contrast, a fully digital trading system would give traders the choice of performing market analysis immediately at their workstations or accessing on-line analysis performed by other analysts on the network.

"They're distributing real-time market data but once it gets to the workstation, they are just displaying it," Bock said. "They do not have the ability to channel real-time market data into real-time analytic software. That's the next phase." ◼

AT&T displays system's skills

continued from page 21

is, but I know it's expensive."

J. Lawrence vanGoethem, director of systems support and telecommunications for Sara Lee Corp. in Chicago, agreed with Frye.

"[Accumaster] Integrator is something we're looking at," he said. "But you have to have a pretty big problem to justify its cost; its entry cost is pretty high."

Accumaster Integrator costs $275,000 for a configuration that includes one AT&T 3B2/600 minicomputer, which drives the system, connections to two net management systems, and other software and peripherals.

An average configuration, which includes connections to six net management systems and two workstations, costs about $300,000. ◼

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Will You Have Enough Power To Deliver ISDN?

Will You Be Ready To Handle Video
When Users Demand It?

Introducing Meridian 1. It will take you confiden

Get ready for the future of business—faster, more intense, more global, and more unpredictable than ever.

New Meridian 1 communication systems were designed for that future.

Designed to handle the power-hungry business applications of the '90s, like integrated voice & data, global networking, voice processing, and automatic call distribution. Designed to bring you new advancements like ISDN and fiber optics as you need them. And designed to handle your unpredictable needs for growth and new applications.

ly into the future.

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Building on the best of Meridian SL-1—the best-selling PBX in the world—we've boosted every measure of system performance. We've increased traffic capacity 25%, and improved real-time capacity 15%.

What's more, our commitment to innovation continues. ISDN Basic Rate Access and more powerful applications are on the way. And we'll be delivering SONET interfaces through FiberWorld, our corporate-wide commitment to leadership in building the network of the future.

EVERY MERIDIAN SL-1 AND SL-100 EVER MADE CAN BE UPGRADED TO MERIDIAN 1.

When we introduced the SL-1 in 1975, we started a trend that no one else in the industry has been able to follow. Northern Telecom owners have never had to trade to upgrade.

With Meridian 1, the commitment continues. Every one of the more than 39,000 SL-1s and SL-100s installed worldwide can be upgraded to Meridian 1. And upgrades are available right now [illegible] all SL-1 models.

NEW MODULAR DESIGN LETS YOU GROW TO 60,000 LINES.

Meridian 1 provides the largest growth range of any PBX. From [illegible] 60,000 lines—more than twice the range of other systems. So you can add lines and features economically as the needs of your business evolve.

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And you'll find Meridian 1 systems the most reliable we've ever made. They're built with the most advanced manufacturing processes, and they use state-of-the-art components. So you can expect lower operating costs.

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There's a complete new array of Meridian Digital Telephones, with from 6 to 60 line and feature keys. There are special telemarketing and secure sets. A new high-performance digital attendant console. Multi-lingual displays. And dozens of ways to bring other display capabilities, line and feature configurations and data services to your users' desktops.

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And to help you manage them all, there's new Meridian Manager, an easy-to-use, PC-based tool for station administration, traffic reporting and work order entry.

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TECHNOLOGY THE WORLD CALLS ON

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YOU'D NEED
A TIME MACHINE.

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Every Meridian SL-1 and SL-100 PBX ever made
can be upgraded to Meridian 1. Upgrades are available
right now for all Meridian SL-1 models.

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TECHNOLOGY THE WORLD CALLS ON

LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

Worth Noting

> "Digital Equipment Corp.'s decision to support 386-based servers in DECnet LANs is necessary for the company to grow its installed base. So far, DEC has wired 500,000 PCs into DECnet LANs, but Novell [Inc.] has five million PCs connected in NetWare LANs."
>
> **Steve Wendler**
> Program director of office
> information systems
> Gartner Group, Inc.
> Stamford, Conn.

Netnotes

Tri-Data Systems, Inc. earlier this month released Ethernet and Token-Ring Network interfaces for its Netway 2000 gateways, which link Macintosh networks to IBM mainframes.

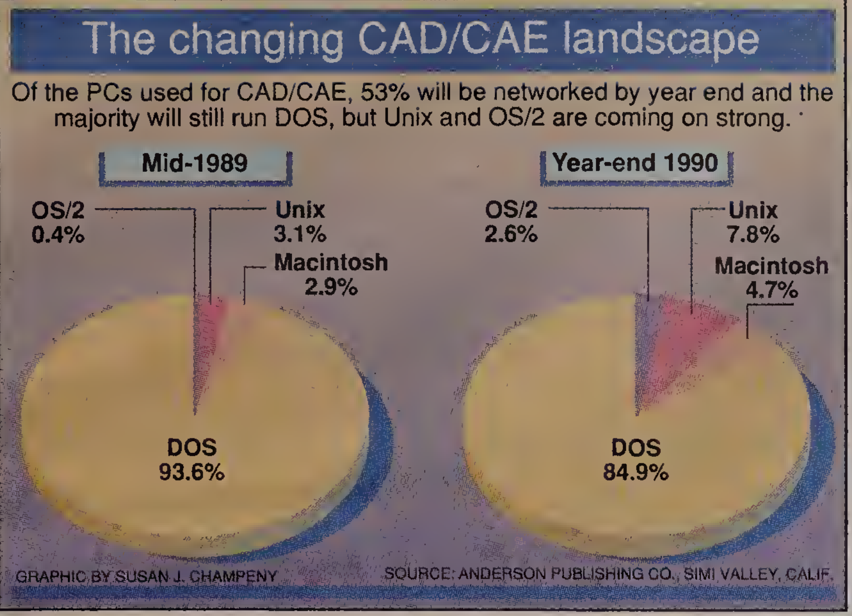
Until now, Macintoshes had to be connected to the Netway 2000 via LocalTalk networks or AppleTalk routers. The new Ethernet and Token-Ring options provide Macintosh users with much faster mainframe connections than are afforded by LocalTalk or direct 3270 coaxial links.

The Netway 2000 functions as a 3270 gateway and an AppleTalk router. It supports RS-232 and V.32 connections and up to 64 simultaneous host sessions.

The gateway unit is based on Sun Microsystems, Inc.'s SPARC architecture and has built-in LocalTalk support, as well as a VME expansion bus with two slots. The new Ethernet and Token-Ring interfaces are VMEbus boards that plug into these slots.

The Ethernet board costs $2,795, while the Token-Ring interface has a list price of $3,695.

For more information, contact Tri-Data Systems at 3270 Scott Blvd., Santa Clara, Calif. 95054, or call (408) 727-3270.



The changing CAD/CAE landscape

Of the PCs used for CAD/CAE, 53% will be networked by year end and the majority will still run DOS, but Unix and OS/2 are coming on strong.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: ANDERSON PUBLISHING CO., SIMI VALLEY, CALIF.

Cisco unveils management software for SNMP nets

NetCentral Station runs on Sun-3 workstations.

By Susan Breidenbach
West Coast Bureau Chief

WASHINGTON, D.C. — At the Communication Networks '90 show here earlier this month, cisco Systems, Inc. of Menlo Park, Calif., introduced network management software for multivendor network devices that support the Simple Network Management Protocol (SNMP).

Designed for a Sun Microsystems, Inc. Sun-3 workstation running X/Window System server software, the new NetCentral Station provides net managers with a visual map of the network that allows for real-time monitoring. It also incorporates Sybase, Inc.'s SQL Server relational data base, which collects network statistics for off-line analysis.

All cisco Systems devices, including bridges, routers and terminal servers, already incorporate SNMP agent software, enabling an SNMP management station to interrogate and collect network performance and traffic data from them. The NetCentral Station software represents cisco Systems' first implementation of the station management portion of SNMP, and it should work with any SNMP agent device, not just cisco Systems'.

> The software provides a visual map of the network that allows for real-time monitoring.

▲▲▲

The real-time map shows network devices as well as the media connecting each of them. When a device or line goes down, its graphical representation on the management station's display changes from green to red. Polling rates and alarm thresholds can be set by the user for each device.

> Polling rates and alarm thresholds can be set by the user for each device.

▲▲▲

The software includes a graphics editor with drawing tools the network manager can use to customize the symbols representing network devices and connections. Real-time statistics of several remote networks can be displayed simultaneously via multiple pop-up windows. The NetCentral Station automatically establishes Telnet connections between the windows and remote devices.

The SQL Server data base is included as a tool that managers can use to analyze network performance trends and traffic patterns. It can help them identify devices or connections that are overloaded, as well as plan network improvements accordingly.

The data base stores SNMP management information base (MIB) variables, such as error count, packet queue length, packet count and routing tables.

Priced at $14,000, the NetCentral Station software is being beta-tested at a number of customer sites. It is scheduled for release this June on the Sun-3 platform.

David Systems and Proteon show wares

Networld '90 product announcements focus on 10BaseT and unshielded twisted-pair ring nets.

By Laura DiDio
Senior Editor

BOSTON — A slew of products were introduced at the Networld '90 trade show here last week, including a number of 10BaseT and unshielded twisted-pair offerings for token-ring local-area nets.

David Systems, Inc. in Sunnyvale, Calif., used the show to unveil its VolksNet Hub, a low-cost 10BaseT-compliant hub for 10M bit/sec Ethernet on unshielded wire.

The VolksNet Hub is a 12-port device that can be configured in a cascade fashion to support other VolksNet Hubs for a total of about 40 users. The hub has 12 twisted-pair ports for workstation connections and a standard IEEE 802.3 Ethernet Attachment Unit Interface.

The hub also has built-in Link Integrity Test software that simplifies network installation by automating the testing of the physical network and confirming for administrators that devices are correctly connected.

"The incorporation of the Link Integrity Test feature in VolksNet means it's no longer necessary for network administrators to run separate network installation software," said Henry Nothhaft, David Systems' president. Other features of the hub include Intelligent Squelch and pre-equalization, which combine to provide basic error-rate levels that are as low as coaxial cable Ethernets, he added.

Connections to individual workstations are made using

(continued on page 26)

Software lets 1-2-3, Excel act as front ends to DB2

By Susan Breidenbach
West Coast Bureau Chief

BOSTON — GUPTA Technologies, Inc. last week released two software products that enable Lotus Development Corp.'s Lotus 1-2-3 and Microsoft Corp.'s Excel spreadsheets to function as front ends to IBM's mainframe-based DB2 data base management system, as well as GUPTA's own SQLBase Server.

The products, SQLVision for Lotus 1-2-3 and SQLVision for Excel, are utilities that enable spreadsheet users on local networks to tap into DB2 by embedding SQL statements in their macros. The statements query DB2 or SQLBase and return the results to the correct spreadsheet cells.

When DB2 is the target data base, the SQLVision software works in conjunction with GUPTA's SQLNetwork, which is host-based connectivity software that makes DB2 appear as a departmental server on the local-area network. SQLVision users with appropriate access rights can update, as well as query, host data.

Trustees Savings Bank in the U.K. has been using prereleased copies of SQLVision in a production environment since June of last year.

"SQLVision is used in our credit card division to get monthly reporting data from the host," said Adrian Windo, a management accountant at the bank. "With SQLVision and SQLBase, my Lotus 1-2-3 spreadsheet running on an IBM Token-Ring PC network is able to access host data on an IBM 3090 mainframe. This data is automatically mapped to my Lotus spreadsheet."

SQLVision comes with a single-user copy of the DOS version of GUPTA's SQLBase engine. According to GUPTA, Lotus 1-2-3 and Excel macro programmers can use this single-user DOS data base to develop applications that will then run against mainframe data bases.

The Lotus version of SQLVision runs as a Lotus 1-2-3 add-on; when it is invoked, an SQLVision menu appears as part of the spreadsheet program. SQLVision for Excel communicates with Excel via Microsoft's Dynamic Data Exchange, the protocol that enables Microsoft Windows applications to share data.

The products were actually developed by Henley Business Software, GUPTA's distributor in the U.K. SQLVision for Lotus 1-2-3 and SQLVision for Excel are priced at $295 each. The price of SQLNetwork ranges from $30,000 to $50,000, depending on the type of mainframe hosting the DB2 data base.

David Systems and Proteon show wares

continued from page 25

standard 10BaseT-compliant Ethernet adapters.

The company has tested the product with Western Digital Corp.'s and Racal InterLan's 10BaseT Ethernet adapters at the University of New Hampshire's newly installed Interoperability Test Lab. "We're in the process of testing 3Com [Corp.'s] board now," Nothhaft said.

The VolksNet Hub costs $99.95 per port and is expected to begin shipping March 1.

Proteon, Inc. in Westborough, Mass., introduced a four-port multistation access unit (MAU) for 4M and 16M bit/sec token-ring LANs. The MAU can be used stand-alone or in conjunction with the company's larger Series 70 Intelligent Wire Center (IWC) to simplify the expansion of IEEE 802.5 token-ring LANs.

The p7302 Workgroup Wire Center (WWC) can be used as the primary wiring center, as the hub for a small office or work group LAN using unshielded twisted-pair wiring, or with other p7302 hubs to support LANs of up to 16 workstations.

Wiring p7302 WWCs into a Series 70 p7202 IWC in a cascade fashion reduces network cabling requirements and increases the number of nodes the Series 70 p7202 IWC can support from eight to as many as 32 workstations.

Most traditional cabling methods, the company noted, require running a separate cable from each personal computer back to the central wiring closet.

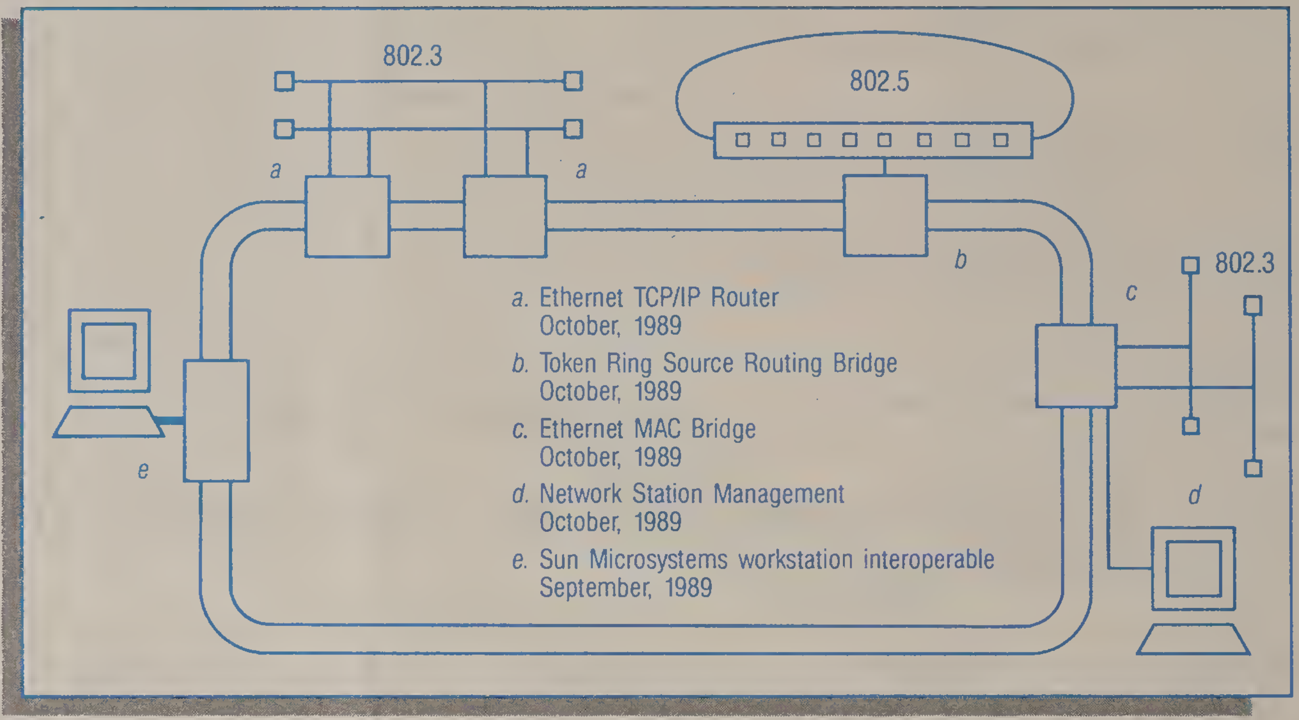
> LEDs and switches on the device provide net managers with monitoring and control of the wire center's operations at a glance.
>
> ▲▲▲

The p7302 WWC features physical network management capabilities. LEDs and switches on the front of the device provide network managers with monitoring and control of the wire center's operations at a glance.

"When the p7302 WWC is connected to the p7202 Series 70 IWC, a faulty network node can be isolated to the particular network on which it resides," according to Proteon President Patrick Courtin. "The network administrator can then isolate that work group from other LANs on the wiring center and repair it without disrupting the other LANs."

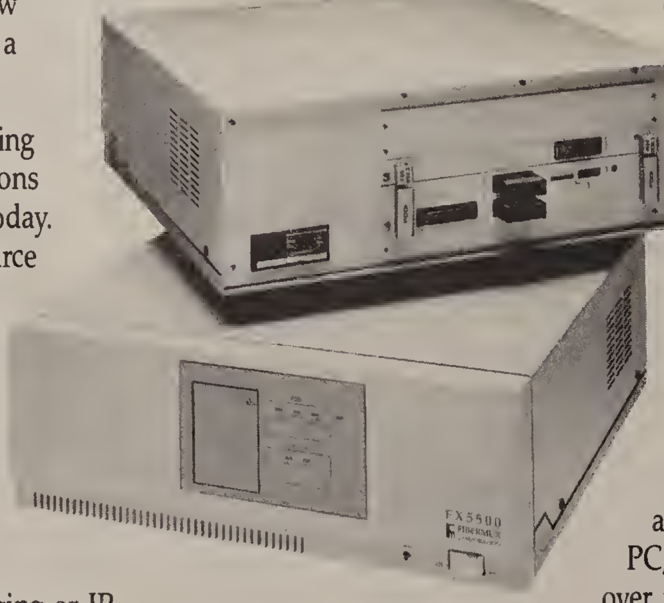
The p7302 WWC lists for $495 and is scheduled to be available in March.

It's Time To Get Serious About FDDI.


802.3
802.5
802.3
a
a
b
c
d
e
a. Ethernet TCP/IP Router October, 1989
b. Token Ring Source Routing Bridge October, 1989
c. Ethernet MAC Bridge October, 1989
d. Network Station Management October, 1989
e. Sun Microsystems workstation interoperable September, 1989

Fibermux thinks it's time you looked seriously at FDDI. First, critical components of the standard are finally complete. That means we've been able to engineer our new FX5500 Series to be fully FDDI-compliant. So a technology investment made now won't be obsolete in a few months.

Second, we're shipping the kind of applications you can really use today. Our Token Ring Source Routing Bridge is designed in strict accordance with IBM specifications for easy setup and LAN Manager use. Choose the multiport Ethernet access unit, providing bridging or IP routing, to build large 802.3 backbones with ease. Our technology has demonstrated capability with Sun Microsystems, Inc.'s new SunNet FDDI/DX controllers (workstation interfaces). In fact, the Native Framing approach we use for LAN packet conversion (as opposed to "frame encapsulation") holds greater promise for future interoperability. And our equipment has been proven successful in one of the largest such networks in the world—over 80 FDDI nodes in one ring and growing.



Last but not least, the FX5500 is from Fibermux, the leader in enterprise fiber-optic networking. We've been designing and delivering systems to integrate Token Ring, Ethernet, IBM 3270 and 5250, voice, and video for the last 5 years. We offer access links to just about every kind of host, PC, or workstation you've got, over nearly any media type. That's enterprise networking experience you can count on.

So if you think it's time to look at FDDI, get serious. With Fibermux's new FX5500 Series. Call (818) 709-6000 or fax (818) 709-1556 today.

Fibermux. Performance Fiber Backbones. We're Serious.

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Router links Ethernets to FDDI backbones

By Walter Sweet
West Coast Correspondent

WASHINGTON, D.C. — Network Systems Corp. last week unveiled a router that connects Ethernet local-area networks to Fiber Distributed Data Interface (FDDI) backbones.

Network Systems' FE640 router can link four IEEE 802.3 Ethernet trunks to a dual-attached FDDI ring, and it has an expansion option for adding four more trunks. The product supports routing of Transmission Control Protocol/Internet Protocols and Digital Equipment Corp.'s DECnet protocols.

Security

The FE640 includes Simple Network Management Protocol (SNMP) agent software and supports Network Systems' Packet Control Facility for greater security.

A prerelease version of the FE640 router was demonstrated at the Interop '89 conference held in San Jose, Calif., last October. During the demonstration, it was used to route traffic among the multivendor FDDI and Ethernet networks on the show floor.

The router is available now and is priced at $36,000. Its introduction comes on the heels of Proteon, Inc.'s announcement that it will be shipping a router connecting Ethernet and token-ring LANs to an FDDI network. Proteon's router is priced about $10,000 less than the FE640 router.

Ken Hardwick, director of advanced software development for Network Systems, attributed the price disparity to the FE640's greater speed and compatibility with a variety of host systems.

"Our box is much faster than the Proteon p4200," Hardwick said. According to him, Network Systems' FE640 router can handle packets four times faster than the p4200. He said another advantage of the FE640 is that it can connect IBM and Unisys Corp. mainframes, as well Cray Research, Inc. supercomputers, into an FDDI network.

Bill Way, a product marketing manager for Network Systems, added that the ability to link to these hosts "makes it possible to construct networks of networks without the usual performance penalties of gateways."

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Dialogue

Does the Federal Communications Commission's recent decision to fine Nynex Corp. $1.4 million for overcharging users show that the agency is doing an adequate job of protecting consumers against abuses by carriers?

"No, I think it's a onetime thing. I think the FCC tries but is not staffed to do a very good job. I think they have admitted that themselves. Certainly, the customers have to be involved through organizations to influence the regulatory process."

Bill Moore
Chairman
Tele-Communications Association, Inc.
Government Liaison Committee
Covina, Calif.

"I think the recent FCC proceedings demonstrate how extremely difficult it is to keep track of RBHC activities. Given adequate staff, they can do this work. The real question is whether they have the staff."

Leonard Evenchik
Director of Communications
Commonwealth of Massachusetts
Boston

"I think it's more of an isolated case. I don't see the high level of enthusiasm that I'd like to see out there among the regulators. They need to take a more active role."

Sam Stafford
Director of Corporate Telecommunications
Supermarkets General Corp.
Woodbridge, N.J.

"I couldn't be sure based on a single action. What concerns me is that it's unclear whether the shareholders [and not the ratepayers] will pay for this. That money should come out of equity."

Ken Phillips
Chairman
Committee of Corporate Telecommunications Users
New York

"I can't say it's a reflection of whether they can do their job. It's tough to judge any federal agency based on a single decision. But it's nice to know that, at least at the moment, they are watching."

Ron Kopitowsky
First vice-president
Communications Managers Association
New York

End-user training a key to success in network projects

Teaching users is a vital part of implementation.

By Wayne Eckerson
Senior Writer

LAGUNA NIGUEL, Calif. — End-user training is a critical, but often overlooked, ingredient in the successful implementation of network and computer technologies.

Information executives may spend millions of dollars on new technologies and work hard to get them to function properly, but the systems can fail if end users refuse to or don't know how to use them.

"We [information executives] tend to get so focused on technology and all its razzmatazz that we forget about the fundamental importance of training," said DuWayne Peterson, executive vice-president of systems and telecommunications at Merrill Lynch & Co., Inc. in New York. "The technology is worthless if people don't know how to use it."

Peterson recently spoke here at The 1990 Conference for Information Executives and Senior Management, which was sponsored by *CIO Magazine* and AMR International, Inc.

Most conference-goers said user-friendly applications with multiple help screens are important for winning end-user acceptance of new technology, but they aren't enough by themselves. Whether users are entry-level clerks or senior executives, companies must provide users with plenty of hands-on training and formal classroom instruction conducted by in-house experts.

" 'Install' is not 'in use,' " said Mitchell Fromstein, a keynote speaker at the conference and president and chief executive officer of Manpower, Inc., a temporary employment agency based in Milwaukee. "Chief information officers need to make training a high priority."

Monday morning blues

End-user training is a critical component of Merrill Lynch's current efforts to install 20,000 IBM Personal System/2 computers in 500 branch offices throughout the nation. The personal computers, which are linked to the firm's mainframes in New York, are replacing Quotron Systems, Inc. dumb terminals, which brokers have used for years, Peterson said.

The success of this massive rollout, which is 60% completed, is largely due to the quality and extent of training users received well in advance of getting the new systems, Peterson said. The firm spent a year developing the training program, which consists of on-site classroom training, hands-on simulations and easy-

(continued on page 28)

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Getting business in step with technology. The prevailing wisdom is that business aims should drive technology decisions. But according to Charles McCaig, senior vice-president of corporate services at Mutual Benefit Life Insurance Co., that equation should be turned on its head.

Speaking at the 1990 Conference for Information Executives and Senior Management in Laguna Niguel, Calif., McCaig said information technology managers should use technology to drive business change.

McCaig said the increasing capabilities and power of desktop computers is making it possible to expand workers' jobs to encompass many more tasks and activities. Instead of fragmenting business functions — such as processing insurance claims — into separate tasks carried out by individual workers, companies can consolidate these tasks into a single job.

"Most businesses today don't use technology to organize business operations in the most efficient and effective way possible," McCaig said. "Information executives must change business processes to take advantage of today's technologies."

McCaig said information technology is creating a new "knowledge worker" who, with the assistance of computer applications, can manage entire operations once divided into multiple tasks and performed by several workers.

(continued on page 28)

MANAGEMENT PROFILE

Boeing Computer Services' Laurie Bride

Standards pioneer talks about future

For most network managers, the concept of open systems is an alluring vision — beautiful in form but distant in reality.

However, a few dedicated network pioneers are working hard to bring the promise of open systems to fruition.

One such leader is Laurie Bride, manager of network architecture for Boeing Computer Services Co. in Seattle. A 24-year veteran at Boeing, Bride has been involved in drafting a strategic plan for implementing Open Systems Interconnection standards at the aerospace company.

For the past five years, Bride has also held several positions in the MAP/TOP Users Group, one of the organizations most active in promoting the development and use of OSI standards.

Bride is currently chairwoman of the MAP/TOP Steering Committee, a position she has held since last fall.

Network World *Senior Writer Wayne Eckerson spoke with Bride last week about the progess being made toward adoption of open systems standards and the benefits to users of becoming involved in the standards arena.*

What concrete benefits can companies gain from participating in groups such as MAP/TOP? Are the benefits worth the financial and resource investments that such involvement requires?

There are tangible and intangible benefits. The most tangible benefit of participating is that companies develop the technical expertise and skills of their staff to allow them to understand and implement OSI-based technology.

Companies that have been involved in this effort since the beginning, such as General Motors and Boeing, have built up considerable knowledge about OSI. You can't hire people with these skills today because no school provides that level of training. And without this knowledge, companies can't adequately prepare and execute a plan to implement OSI-based technology.

The intangible benefits are more future-oriented. Companies that get involved in MAP/TOP can shape OSI standards to meet the future needs and requirements of users. MAP/TOP committees discuss the requirements the standards must meet to benefit users in all industries.

For example, users make sure the standards are flexible enough to meet the needs of the manufacturing industry as well as the service industry. Standards developed with only vendor input won't meet real-world user requirements.

The potential value of open systems is tremendous, but it's not going to become a realilty unless users are willing to get involved in the standards development process and push to get their requirements heard.

How can network managers benefit professionally and personally from participating in the MAP/TOP Users Group?

(continued on page 28)

User training a key to success

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to-read manuals. In addition, the training program was instituted at each branch office seven months prior to the system cutover.

With the help of human resources, Peterson assembled a training team that reports directly to him.

"Training is absolutely critical to making a project of this magnitude succeed," Peterson said. "If our brokers come to work Monday morning after the cutover and don't know how to use the system to handle customer orders and inquiries, Merrill Lynch would be flat on its back."

Star Trek training

Frito-Lay, Inc. faced a daunting training challenge when it issued to its 10,000 drivers hand-held computers that can be used to enter customer orders and document deliveries. Most of the drivers had little, if any, exposure to computers, said Charles Feld, vice-president of information systems at the Plano, Texas-based firm.

The company needed to make sure drivers didn't feel threatened by the new technology and that the devices would enhance their work, not undermine it. To help ease the drivers into the world of high tech, the company put together a flashy training film narrated by actor William Shatner and based on the *Star Trek* television show.

In addition, after completing formal classroom training, each driver was given a hand-held terminal to take home for four weeks.

"We didn't care what they did with [the terminals], we just wanted them to get comfortable having the things around," Feld said.

Inner strength

The Los Angeles Unified School District found out the hard way that the best training programs are often the ones developed and administered in-house.

When the district decided to automate the procedures for reporting the number of hours employees work each week at its 1,100 locations, it called in two major vendors to train users to use the new mainframe-based application.

Previously, all time reporting was done by hand and mailed into a central location.

"The vendor programs failed miserably," said John Nagata, assistant superintendent of information technology for the school district.

Nagata said that while the vendors' trainers could teach users how to manipulate a computer application, they couldn't educate users about time reporting.

"We realized there is a big difference between training and education," Nagata said. "Unless users fully understand time reporting, they won't be able to effectively use a computer application."

Nagata decided to enlist teachers and administrative workers who were familiar with time reporting to develop and conduct the training program. These trainers also worked with the school's programmers to develop the time-reporting application so it would be as user friendly as possible.

The core training program consists of 16 hours of classroom instruction at three regional centers that combines lectures, hands-on experience and exercises. The instruction is broken down into manageable units so users aren't overwhelmed by information.

Once back at their jobs, users can call a hot line number or refer to a manual written by the training staff if they have any questions.

Under the direction of a former district school principal, the training team has successfully trained 1,500 users in the past 18 months, Nagata said.

"The credibility the trainers have with the users is the key to an effective program," Nagata said.

Executive Briefs

continued from page 27

Offices of the future. Besides changing the way businesses are run, telecommunications and information systems are changing the way business offices are designed.

A recent survey shows that an overwhelming majority of top executives, facilities managers and interior designers believe telecommunications and computer needs will have the greatest impact on office design in the next five years.

The office work space of the future will strike a balance between computer users' need for privacy and their need to interact with colleagues on business projects. These offices will provide users with desks that easily accommodate computers and associated cabling, plenty of space to spread out work and comfortable, adjustable chairs. These spaces will also provide ample storage and filing space, as well as adequate lighting.

The survey, called the 1989 Office Environment Index, was conducted by Louis Harris and Associates, Inc. and sponsored by Steelcase, Inc., an office furniture manufacturing company based in Grand Rapids, Mich. The survey was based on interviews with 1,000 office workers, 150 top executives, 150 contract interior designers and 150 facilities managers at large organizations.

Pioneer talks about future

continued from page 27

Managers need to have a good sense of where technology is going so they can move the company's network and the organization in that direction. Also, it is difficult to manage a staff of technical people if you don't have some feel for the technology they're deploying. The MAP/TOP Users Group is a marvelous forum to develop that understanding.

Why has the production and installation of products conforming to MAP/TOP standards proceeded slower than expected?

We incorrectly estimated how long it would take vendors to develop OSI products, and vendors underestimated the difficulty of getting the products market-ready. The reverse side of the coin, however, is that few users understand the amount of planning needed to implement OSI on a large scale. It's easy to do small pilots, but major installations require extensive planning.

Everyone talks about the chicken-and-egg syndrome. That's exactly what's happening with OSI. The vendors won't develop products until there is market demand, and the buyers won't plan for OSI until they see vendors begin to develop the products they need.

Also, something of this magnitude hasn't been accomplished before. The closest parallel is TCP/IP, and that didn't have the complexity or breadth of activity as OSI. With TCP/IP, the Department of Defense fed the project a lot of seed money to make it happen. That hasn't happened with OSI. It will take longer than we had hoped, but we will reach the level we need to reach sooner because we were involved.

Are there other forces at work impeding the progress of open systems, such as cultural barriers within user companies?

Cultural barriers play a large role. Most companies have islands of proprietary networks running specific applications for separate departments. But to embrace open systems, users need to relinquish the idea of owning their own network. They need to envision a company network. Instead of saying, 'I want my system and my network,' they have to say, 'I want my system, and I want to be a citizen of the company's network.'

This is not an easy change to make. It stirs up turf wars among groups. For example, many companies have different groups that support factory networks, a central data center, and associated networks and engineering systems. These people often don't talk to one another.

OSI's success requires a readjustment in thinking. It requires a willingness of end users to cooperate and give up ownership of their piece of the network to build this infrastructure.

Many vendors claim that the reason they haven't produced more MAP/TOP-compliant products is because there is little demand for them from users. Do you agree?

There has been plenty of demand from users, but it hasn't been realized in orders. Users typically don't anticipate the amount of preparation needed to implement large OSI-based nets.

But on the other hand, how many vendor ads do you see promoting and marketing MAP and TOP products? How many vendor ads do you see pushing OSI?

Frequently, when users say they want a MAP-compliant product, the vendor will say it's not available yet and steer the customer to their proprietary products. Until vendors educate users and are willing to build the market the same way they do for their proprietary equipment, there will be little demand for OSI products.

> To embrace open systems, users need to relinquish the idea of owning their own net.
>
> ▲▲▲

How committed do you think major computer vendors such as Digital Equipment Corp. and IBM are to open systems?

It's hard to say. I feel that there are strong proponents in all vendor companies to move in the direction of OSI. More companies are realizing they have to move in this direction, and IBM and DEC will be in the forefront.

However, vendors are having a difficult time putting together a marketing strategy for OSI products. Products are sold today on the basis of differentiation — that they have better bells and whistles than competing products. Marketing people don't know how to differentiate OSI products because the advantage in using them comes from the fact that they share identical characteristics with competing products.

In many cases, they are giving the wrong message right now. The sales pitch should not try to compare and contrast the superiority of different OSI products, but rather how these products allow companies to use scores of marvelous applications they couldn't use before.

Despite the obstacles, what are the driving forces that will eventually force the adoption of open systems?

The high cost of installing useful applications on proprietary systems. It is very difficult and costly to change hardware platforms today because such a move affects all applications on the system. It means you have to redo everything and start over again.

Ultimately, however, the drive to open systems and OSI will be fueled by the tremendous opportunities it presents. Allowing people to exchange information between any two computers with the same ease that people today can talk to anyone in the world via the telephone is a powerful capability.

Is the U.S. falling behind Europe and Japan in adopting open systems?

I'm reluctant to say we are falling behind because we watch carefully what goes on in Europe and Japan, and they follow our activities closely. As a result, the development paths tend to mirror one another. MAP/TOP has been a catalyst for many European and Japanese activities.

However, the Europeans and Japanese get more government funding and participation, which helps somewhat. Also, companies in Europe and Japan aren't quite as competitive as we are, and their laws help them work more closely together.

In the U.S., we have a hard time doing long-range thinking. We do market surveys to death. Companies only start developing products when users begin expressing a need for them. But this means users have to wait a long time before products hit the market. Vendors need to be more forward-looking and invest in products early so they will be ready at the same time users want them.

Why did the MAP/TOP Users Group decide to merge its membership with the Corporation for Open Systems International (COS)?

It is time to start consolidating efforts. One of the signals we're trying to give is that the OSI development effort has been fragmented into too many different groups and activities. We would like to see complementary activities brought together under a common umbrella.

What relationship does the MAP/TOP Users Group have with the Government OSI Profile (GOSIP) effort, which is overseen by the National Institute of Standards and Technology (NIST)?

We have harmonized our work with NIST. GOSIP is compatible with MAP and TOP. Also, we are looking for further collaboration, perhaps sharing activities and developing a common text. We have let NIST know our desire to consolidate specifications at some point in time since they really serve a similar purpose.

Worth Noting

France Telecom has been maintaining network equipment on its premises for three large U.S. companies since last year. A carrier official said other users can lease the equipment and maintenance service from France Telecom for approximately $1,500 to $5,000 per month, depending on the type of equipment.

World News

Infonet Services Corp., an El Segundo, Calif.-based international value-added network operator, last week introduced a new flat-rate pricing scheme called Virtual Private Network.

For a single fee ranging from $8,640 to $49,920 per month, a user can send and receive virtually unlimited traffic to any number of locations through the Infonet network. Users can access an Infonet facility using dedicated circuits ranging from speeds of 9.6K bit/sec to 19.2K bit/sec.

The arrangement is described as an alternative to private lines for users with a large volume of international data traffic.

AT&T last week announced price reductions of as much as 64% for facsimile messages sent internationally using AT&T MailFAX, an optional feature of AT&T Mail.

MailFAX allows users with modem-equipped personal computers or terminals to send messages to fax machines. The service will automatically resend messages until they are received and can be accessed using a toll-free number.

AT&T said MailFAX is now available to seven new countries: the Fiji islands, Ghana, India, Ivory Coast, Maldive, Mauritius and Rwanda. ◼

Major delays a fact of life in building int'l networks

Consultant warns users about global net pitfalls.

By Barton Crockett
Senior Editor

NEW YORK — Users should expect the job of building an international network to take at least three times as long as setting up a network in the U.S.

So warns Ron Kopitowsky, an independent consultant who, until recently, worked as a telecommunications manager specializing in international communications with Irving Trust Co.

During his 13-year stint with the commercial bank, based here, Kopitowsky built networks into such overseas locales as the U.K., Hong Kong, Singapore, Japan, the Philippines and Venezuela. In addition to working as a consultant, he currently teaches telecommunications project management at New York University.

In an interview last week, Kopitowsky discussed some of the common problems facing managers building international nets.

According to Kopitowsky, one of the most important lessons he learned is that international networks typically take longer to build than originally planned. Time zone differences, problems in obtaining equipment and slow carrier service add lengthy delays to the process of setting up a global network. Users need to take that into account when planning an international network.

Frequently, Kopitowsky said, users fail to plan for network growth and, as a result, end up installing equipment in one location that is not approved for use at another location. Users also fail to allocate enough space at international sites to accommodate expanding equipment needs.

"It's one of the biggest mistakes I see," he said.

Kopitowsky offered some advice for simplifying the construction of international networks. He suggested that users carefully evaluate the level of support an equipment vendor can supply a user in a foreign country. "Everyone will say they can ship the box

(continued on page 30)

Bank dumps private lines for VSAT net in Mexico

By Joe Panepinto
Staff Writer

MEXICO CITY — Chase Manhattan Bank, N.A. last week said it has shifted its U.S.-to-Mexico voice and data traffic from terrestrial private lines to a very small aperture terminal network.

The bank will use 64K bit/sec Ku-band satellite service provided by Overseas Telecommunications, Inc. (OTI) in place of the 9.6K bit/sec analog private lines previously provided by OTI.

Financial service data from Chase Manhattan in New York is routed over a shared fiber-optic T-1 link provided by OTI to OTI's Gateway Earth Station in Dallas. It is then beamed off Mexico's Morelos satellite to a VSAT at the bank's facility here.

More bandwidth

The VSAT net, which carries a mix of voice, data, electronic mail and facsimile traffic, gives the Manhattan-based bank increased bandwidth as well as more reliable international service.

Manny Ceara, western hemisphere telecommunications manager for Chase Manhattan, said the new VSAT system costs about the same as the old analog circuits but provides twice the bandwidth.

Alexandria, Va.-based OTI maintains end-to-end service of the network including the on-premises downlink equipment at Chase Manhattan's subsidiary in Mexico.

OTI also provides VSAT networks for Unisys Corp., Volkswagen AG, NCR Corp. and Reuters Holdings PLC.

> The net gives the bank increased bandwidth as well as more reliable international service.
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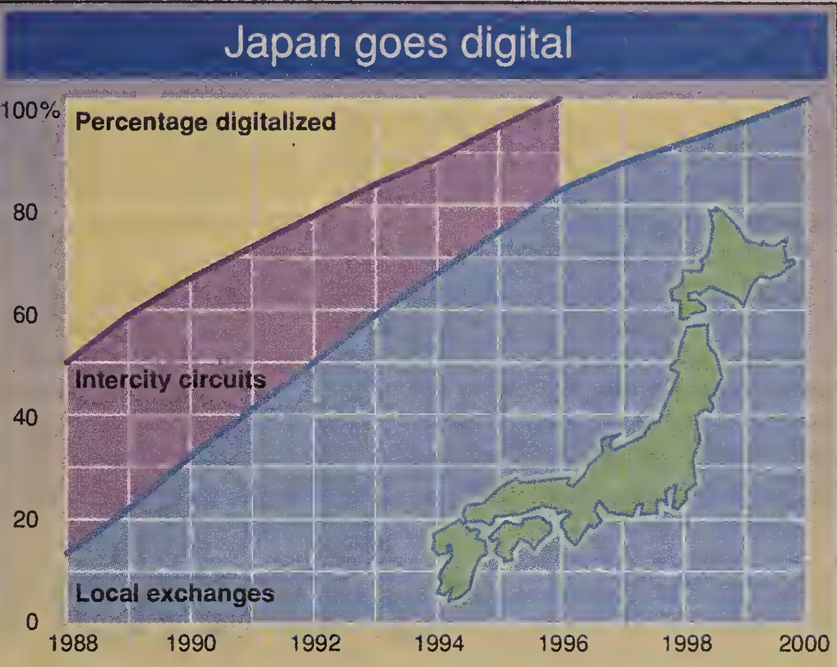
According to a spokesman at OTI, satellites support a large amount of the bandwidth-intensive traffic between the U.S. and Mexico because the Mexican national telephone company, Telefonos de Mexico S.A., does not offer high-capacity terrestrial service. ◼

Japan goes digital



NTT's plans for converting to all-digital public network facilities.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: NIPPON TELEPHONE AND TELEGRAPH, LTD., TOKYO

Reform sweeps New Zealand, Australia

Regulatory changes will lead to new competition, wider array of service options and lower pricing.

By Barton Crockett
Senior Editor

Major regulatory reforms under way in Australia and New Zealand promise to benefit international network users through lower prices and a wider array of service options.

Last July, the Australian federal government, based here, implemented a series of reforms through the Telecommunications Act of 1989. The legislation eased restrictions on ownership of premises equipment, opened up competition in value-added network services and established a new regulatory authority separate from the monopoly domestic carrier.

Earlier, in April, New Zealand dropped most barriers to competition with the country's dominant carrier, Telecom Corp. of New Zealand. The country now has one of the most progressive regulatory structures in the world, and a consortium of vendors, led by U.S.-based MCI Communications Corp., is planning to establish an alternative carrier there.

The changes in both countries should lead to lower prices and a wider array of service options for users. The Australian legislation is particularly important for U.S. companies since many users have established network hubs in Australia for communications to sites in Southeast Asia and the Pacific Rim.

"We believe the free market is the best way to meet users' needs, and the governments here are starting to realize that," said Wally Rothwell, executive director of the Sydney-based Australian Telecommunications Users Group.

In Australia, the move to open up competition is focused on the domestic market, currently monopolized by the Australian Telecommunications Corp., also called Telecom Australia.

Under the Telecommunications Act, Telecom Australia retains a monopoly over switched services, extraterrestrial private lines and public X.25 packet switching. Alternative suppliers are free to build value-added networks (VAN) that use Telecom Australia facilities.

> "We believe the free market is the best way to meet users' needs," Rothwell said.
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Rothwell estimated that there are about 50 VAN operators today, compared to five last year. Although alternative VAN service providers existed before the Telecommunications Act, Rothwell said few firms entered the market because of fears that regulators would force them back out.

The Telecommunications Act also revamped Australia's network policy-setting mechanisms.

(continued on page 30)

Reform sweeps New Zealand, Australia

continued from page 29

Responsibility for establishing regulatory policy now rests with the Department of Transport and Communications. The newly created Australian Telecommunications Authority (AUSTEL) is responsible for enforcement of these guidelines and for hearing complaints against the monopolistic domestic carrier.

This latter change is particularly important for users in the private-line arena, where Telecom Australia currently sets its own rates. Rothwell said that AUSTEL provides a better forum for airing user concerns than previous arenas, which were dominated by carrier representatives.

In addition, prices for switched services now are governed by a price-cap scheme under which increases are limited to no more than the rate of inflation minus 4%. Another provision of the Telecommunications Act ended the domestic carrier's monopoly over approving customer premises equipment for use on the public network. Now this authority is being divested to independent testing agencies, a move which is expected to increase the range of equipment available to users.

More to come

More regulatory changes are on tap. Rothwell said it is likely that the Transport and Communications Department will soon ease restrictions on shared networks and allow at least two mobile cellular operators in the country.

Last January, the Department of Transport and Communications issued a request for comments as part of a major review of the country's regulatory policy. Rothwell said this review could ultimately lead to the authorization of competition with Telecom Australia in all but basic switched voice service. It could also result in the implementation of price caps for packet-switching services and possibly for private lines, and the legalization of competition with Australia's monopolistic international carrier, OTC Australia.

Rothwell added that the implementation of price caps for dedicated circuits would be particularly important to users because Telecom Australia recently increased some dedicated line rates by as much as 20%. He said the carrier may be attempting to migrate users from dedicated lines to Integrated Services Digital Network offerings. "They've invested a lot of development money into [ISDN], and I think they want to make sure they get a good return," he said.

In New Zealand, barriers to competition started to fall in 1987, with the adoption of regulatory reforms that phased in full competition over a two-year period.

Now, MCI, along with Todd Corp., Ltd. and New Zealand Railways Corp., is forming an alternative carrier. In anticipation of this, Telecom Corp. of New Zealand is planning to start charging for local calls, which are currently free, and to reduce the cost of long-distance calls by approximately 50%.

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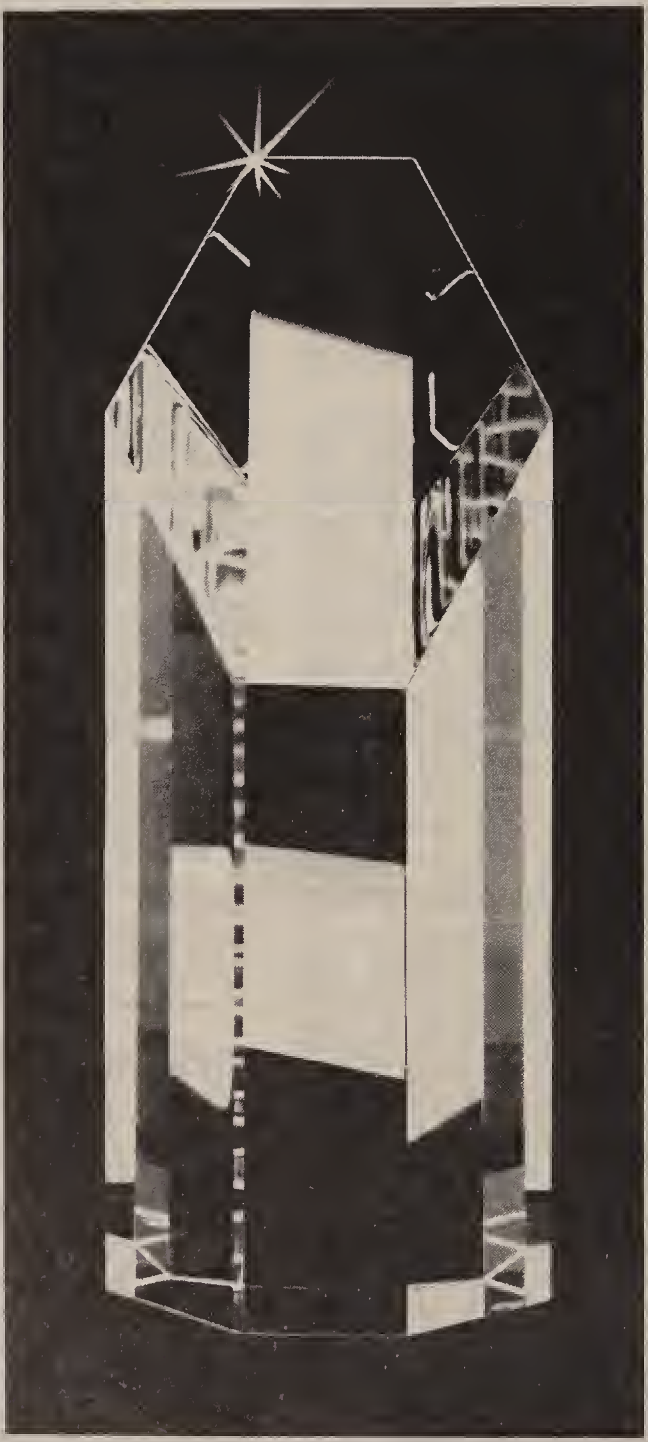

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Delays a fact of life in building int'l nets

continued from page 29

to you," he said. "What you want is to find out if they can service it quickly if something goes wrong."

Kopitowsky said users should find out whether anyone else is using the equipment in that country and about the quality of service provided. They should also ask whether the vendor has a local support organization there.

He said users should be prepared to deal with foreign regulations that are vastly different than those in the U.S. Among the most irksome regulations are those covering transborder data flow.

Some countries, such as West Germany, maintain tight control over the transmission of data, such as information about residents, across national borders. "It's a real Big Brother kind of fear," he said.

Users should prepare carefully in advance of meeting with carriers to discuss the applications to be supported by the international network, Kopitowsky advised. This way, problems involving such things as transborder data flow can be worked out as early as possible.

Often, he said, restrictions on communicating information about a country's residents across borders can be overcome by doing such things as storing customer names in local data bases and only communicating customer account numbers to computers abroad.

Kopitowsky also suggested several things users can do to speed up the process of building international networks. One is to work with international standards such as X.25 and Open Systems Interconnection. "Standards-based technologies are much more widely used internationally than in the U.S.," he said. "You can avoid a few headaches and implementation delays by using standards whenever possible."

Kopitowsky also suggested that users employ personal computer-based project management software to coordinate international network implementations. "They give you a much clearer understanding of the consequences of a delay in one area, which is the kind of information you need to keep things on track," he said.

These software packages can also be used to maintain scheduling information for access by employees around the world.

Network managers should try to hire indigenous network staffers whenever possible, Kopitowsky suggested. Transplanting U.S. workers to man overseas network facilities can be prohibitively expensive, especially if moving expenses and housing compensation are included.

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

19.2K modem offers a two-channel mux

Universal Data Systems (UDS) recently announced a 19.2K bit/sec leased-line modem with a built-in two-channel multiplexer.

The **UDS 1922** synchronous modem's time-division multiplexer reduces user costs by enabling two data terminal equipment devices to share a single line. The UDS 1922 uses a proprietary modulation technique that allows it to operate in full-duplex mode over four-wire lines at 12K, 14.4K, 16.8K and 19.2K bit/sec.

The new modem features an adaptive data rate feature that allows the data rate to increase or decrease automatically to suit line conditions. It also includes a V.33 mode for connection to other non-UDS modems at 14.4K bit/sec.

UDS 1922 is expected to be available March 1 for $2,995.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805; (205) 721-8000.

Multi-Tech rolls out two X.25 PAD models

Multi-Tech Systems, Inc. recently introduced an X.25 packet assembler/disassembler.

The **MultiMuxX25** is available in two models: the MMX2508, which has seven asynchronous RS-232 ports and supports a single X.25 trunk, and the MMX2516, which supports either 15 asynchronous ports and a single X.25 trunk or 14 ports and two X.25 trunks.

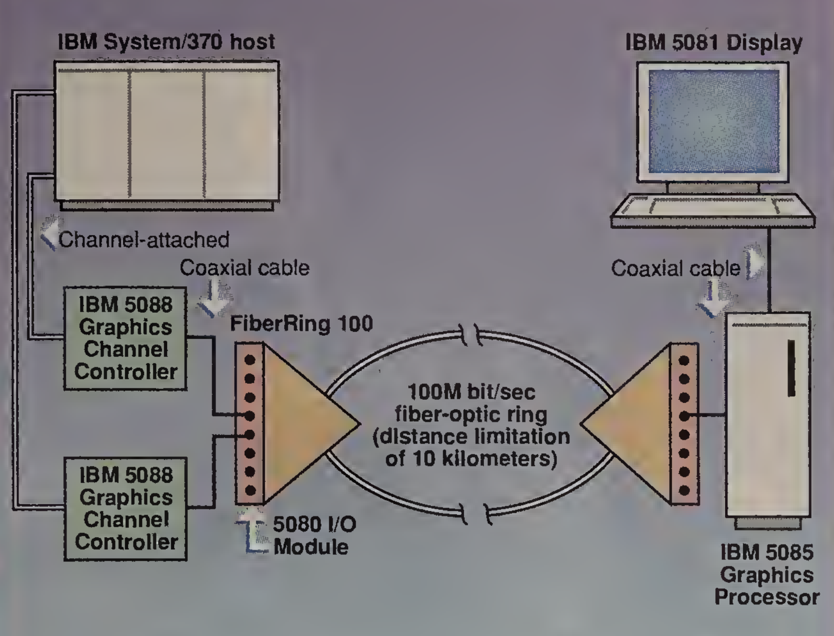
The asynchronous ports can connect terminals, host computers or modems to an X.25 trunk at speeds up to 19.2K bit/sec.

The PAD supports X.25 trunks at speeds up to 64K bit/sec via RS-232, V.35 or X.21 connections. MMX2516s configured as dual-trunk PADs enable full packet switching between trunks, eliminating the need for separate packet switches.

Both models are scheduled for availability on April 1. The MMX2508 costs $3,999, and the MMX2516 costs $5,499.

Multi-Tech Systems, Inc., 2205 Woodale Drive, Mounds View, Minn. 55112; (612) 785-3500. ☑

Interface breaks distance barrier


IBM System/370 host
IBM 5081 Display
Channel-attached
Coaxial cable
Coaxial cable
IBM 5088 Graphics Channel Controller
IBM 5088 Graphics Channel Controller
FiberRing 100
100M bit/sec fiber-optic ring (distance limitation of 10 kilometers)
5080 I/O Module
IBM 5085 Graphics Processor

IBM 5085 Graphics Processors can now be located up to 10 kilometers from an IBM 5088 Graphics Channel Controller.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: RAYCOM SYSTEMS, INC., BOULDER, COLO.

Mux card extends reach of IBM's graphics system

Processors, controllers can now be 6 miles apart.

By Tom Smith
New Products Editor

BOULDER, Colo. — Raycom Systems, Inc. recently introduced an interface for its fiber-optic multiplexer that enables users to vastly increase the distance between IBM graphics workstations and an IBM mainframe.

The 5080 I/O Module is an add-on board for Raycom Systems' FiberRing 100 multiplexer that enables users to deploy IBM's 5080 graphics systems up to 6.2 miles away from an attached host by connecting it over a proprietary fiber network.

A typical application for the product would be in a campus computing environment in which IBM 5085 Graphics Processors in one building are supported by a mainframe in a data center.

Time-division multiplexing

The FiberRing 100 multiplexers use time-division multiplexing to divide a 100M bit/sec dual counterrotating ring network into 7M bit/sec channels. Those channels can support 14 point-to-point connections, or 28 interfaces, on one ring with a maximum distance between two multiplexers of 6.2 miles, or 10 kilometers.

Previously, users daisy-chained up to 32 5085s over coaxial cable to 5088 Graphics Channel Controllers at lengths up to 3,300 feet.

FiberRing 100s link remote IBM 5085s to central-site IBM 5088s through a FiberRing 100 at the host site.

A 5080 I/O Module at the remote site supports up to 32 5085s, and a 5080 I/O Module at the host site supports two 5088s.

The 5085 is used in high-performance graphics applications such as computer-aided design and manufacturing. IBM 5081 Display monitors attach to the 5085 processors; the 5085s, in turn, establish IBM 3270 terminal-emulation sessions with the host.

The 5085s communicate with a mainframe through a 5088, a channel-attached terminal control unit at the host site.

By multiplexing what would otherwise be separate connections on a single fiber-optic ring, the module cuts cabling requirements and costs while also simplifying network changes, according to Lee Giacoletto, senior engineer at Raycom Systems.

> The module enables users to deploy 5080 graphics systems up to 6.2 miles from the host.
>
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"Users that need to rearrange their network configuration can simply detach a [5085] from one module and reattach it to another," rather than removing a coaxial cable and installing a new one, Giacoletto said.

Each 5080 I/O Module has two sets of four ports. Each set of four ports supports up to 16 5085s; a maximum of 16 can be

(continued on page 34)

DEC preps BRI board for VAX LAN servers

Interface to support ISDN links between LANs; company also unveils network terminal server.

By Laura DiDio
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. next month will introduce its first Integrated Services Digital Network product, a MicroVAX interface that will enable users to link local-area networks over wide-area ISDN links.

According to documentation provided by analysts briefed on the product, the DEC ISDNcontroller 100 is a single-board, synchronous controller for Q-bus MicroVAX machines configured as LAN servers.

The ISDNcontroller 100 has a Motorola Corp. 68000 microprocessor and 128K bytes of onboard memory.

Accessing ISDN

The adapter supports a single ISDN Basic Rate Interface line, which provides two 64K bit/sec B channels and one 16K bit/sec D channel. Any MS-DOS-, VMS- or Ultrix-based workstation on a MicroVAX-attached Ethernet LAN can access the ISDN services.

The software for the device, which runs on the server, controls the ISDN signaling and performs all LAN and wide-area network management functions.

The software manages each of the ISDN B channels separately, meaning a single interface can support ISDN connections to two remote LANs simultaneously. Customers also will be able to use both channels to establish a 128K bit/sec link between two LANs. The device will not support voice communications.

Besides making it possible to establish high-capacity digital links on an as-needed basis, the DEC ISDNcontroller 100 will enable users to take advantage of ISDN features, such as the ability to screen incoming calls by the telephone number of the dialer.

DEC is targeting the product at corporate users that need to transfer large amounts of data among multiple remote offices. The ISDNcontroller 100 sells for $3,500; the product is scheduled

(continued on page 34)

Vitalink, Halley upgrade net management systems

By Walter Sweet
West Coast Correspondent

WASHINGTON, D.C. — Vitalink Communications Corp. and Halley Systems, Inc. recently introduced new versions of their network management systems, which have been enhanced with data base management functions to help track network traffic and usage better.

Vitalink released WANmanager 1.1, which boasts a new SQL relational data base engine for analyzing long-term network trends that help users refine capacity planning. The previous version was designed more for day-to-day network management than for long-term trend tracking, the company said.

The new relational data base registers network performance parameters, such as traffic volume and the frequency of errors in a network. This information can then be compiled into graphic and tabular reports to chart network performance.

New features in WANmanager 1.1 include a Simple Network Management Protocol (SNMP) client, an expansion of the node performance monitoring facility and the ability to transmit system graphics to a laser printer.

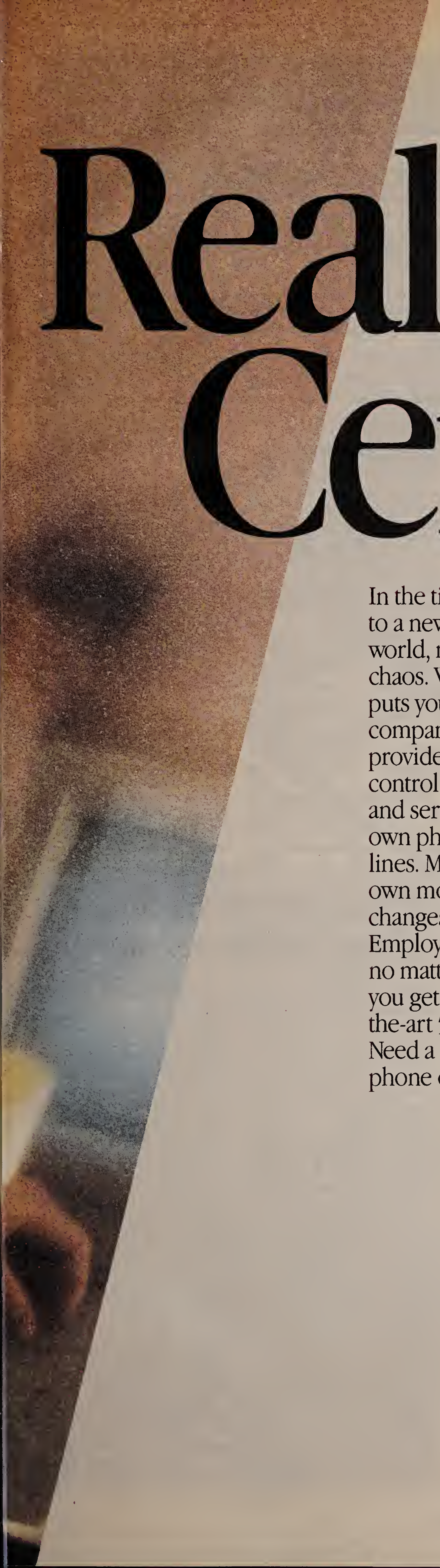
The SNMP client is software that resides in the router and allows network managers to monitor the management information base (MIB), the routing controls embedded in Vitalink's TransPATH units. Adding an SNMP client gives users the opportunity to compile and analyze more of the network's data.

It can monitor all of Vitalink's local-area network interconnection products, as well as some from other vendors, including Digital Equipment Corp.'s LAN Bridge, Chipcom Corp.'s Ethermodem III and StrataCom, Inc.'s IPX T-1 multiplexers.

The node performance monitoring facility now includes a list of bridge parameters and the SNMP MIB variables, which means it can monitor all of Vitalink's LAN interconnection products, as well as other vendors' units.

WANmanager, for the first

(continued on page 34)



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Avatar extends micro-host connectivity to Mac LANs

Three new gateways support variety of LANs.

By Tom Smith
New Products Editor

HOPKINTON, Mass. — Avatar Corp. recently expanded its line of microcomputer-to-mainframe products with three gateways that give Apple Computer, Inc. Macintosh users on local-area networks several choices to communicate with IBM mainframes.

Macintosh users can now opt to establish IBM 3270 terminal emulation sessions with System/370 mainframes over coaxial connections, Synchronous Data Link Control lines or IBM Token-Ring Networks.

The new gateways are the MacMainFrame Coax Gateway, the MacMainFrame SDLC Gateway and the MacMainFrame Token Ring Gateway.

These products provide Macintosh users with host connectivity options that were previously unavailable from Avatar and other vendors, according to Joyce Enos, MacMainFrame product manager.

Server hardware and software is available for the Macintosh SE, SE/30 and II models. Client software operates on any Macintosh from the Macintosh Plus to the Macintosh II models.

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"We're going to have a lot of doors opening for Apple in terms of placing additional Macs into large end-user accounts," she said.

Avatar's previous offerings enabled Macintosh users to establish point-to-point links between a stand-alone Macintosh unit and an IBM mainframe; a shared gateway did not exist. Those products will still be offered for users that require dedicated or occasional dial-up access to IBM hosts, Enos said.

Each of the new gateways, like earlier MacMainFrame products, is based on a client/server architecture, with a gateway card and software residing on a server and client software residing on each workstation node.

The gateway component can reside in an existing AppleShare local-area network server, which saves users the expense of dedicating a Macintosh as a gateway.

For all three gateways, server hardware and software is available for the Macintosh SE, SE/30 and II models.

Client software operates on any Macintosh from the Macintosh Plus to the Macintosh II models.

All three gateways support Apple's AppleTalk Data Stream Protocol for communications, which enables them to access sessions running on another MacMainFrame server.

The server can reside on any LAN supporting the AppleTalk protocol, which includes LocalTalk, EtherTalk or TokenTalk LANs. The latter two are Apple implementations of Ethernet and token ring.

All three products are expected to be available in the second quarter.

Coaxing coax users

MacMainFrame Coax Gateway's server card enables users to establish up to five sessions from a LAN to a remote IBM host.

All sessions must be routed through an IBM 3174/3274 terminal controller that converts data from AppleTalk to 3270 protocols. Five different workstations or a single workstation supporting IBM's Distributed Function Terminal mode can establish concurrent sessions with the host.

The coaxial gateway costs $2,495.

MacMainFrame SDLC Gateway provides an RS-232 interface from a LAN to a synchronous modem operating at speeds ranging from 1,200 to 56K bit/sec. It converts data from AppleTalk to Synchronous Data Link Control protocols and vice versa.

Using this gateway, Macintosh users don't have to implement a terminal controller, which typically sets up microcomputer-to-host sessions.

The server on which the gateway resides is able to distribute eight, 32 or 64 sessions across the network, depending on the software version chosen by the user.

The server on which the MacMainFrame SDLC Gateway resides is able to distribute eight, 32 or 64 sessions across the network, depending on the software version chosen.

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MacMainFrame SDLC Gateway costs $2,495 for eight host sessions; $4,495 for 32 sessions and $6,495 for 64 sessions.

Gateway to token rings

MacMainFrame Token Ring Gateway links Macintosh users over a 4M bit/sec token-ring network to an IBM host. The gateway converts AppleTalk protocols into IBM 3270 data streams and supports from eight to 64 3270 emulation sessions between the host and Macintosh microcomputers.

A token-ring gateway supporting eight host sessions costs $2,495; a 32-session gateway is priced at $4,495; and one with 64 sessions costs $6,495.

Avatar can be reached in writing at 65 South St., Hopkinton, Mass. 01748, or call (508) 435-3000.

DEC preps board for LAN servers

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to ship in March.

In other company news, DEC used the recent Communication Networks '90 trade show in Washington, D.C. to introduce a low-cost terminal server for its existing family of servers.

The new MUXserver 310 is a LAN-attached device that, like the existing and larger MUXserver300 product, offers the dual functionality of a terminal server and a statistical multiplexer.

The MUXserver 310 can support two remote DECmux 300 multiplexers — each of which has eight asynchronous local ports — over 64K bit/sec dedicated digital links.

The larger MUXserver 300 supports a maximum of 48 connections.

DEC is positioning the new 300 series MUXserver and DECmux products to replace the older Series 100 product family, called the MUXserver 100 and DECmux II.

The MUXserver 100 can only support 19.2K bit/sec links to remote DECmux IIs.

The MUXserver 310 is available now and costs $5,800.

DEC FDDI intro delayed?

Sources close to DEC, who asked not to be identified, said the expected introduction of the company's first 100M bit/sec Fiber Distributed Data Interface (FDDI) products next month has now been pushed back to July.

DEC had been scheduled to release several FDDI offerings, including a bridge that would link Ethernet networks to an FDDI backbone, as well as FDDI adapters for its high-end VAX systems, the sources said.

Card extends reach of system

continued from page 31

daisy-chained per port as long as the total supported by the four ports does not exceed 16. A single 5080 I/O Module supports 32 workstations, each of which can be linked via coaxial cable at a distance up to 2,000 feet.

On the mainframe side, a single 5080 I/O Module supports two 5088s, with each set of four ports supporting a single controller.

Each 5088 supports a data stream of 2M bit/sec, so there is no bottleneck with a 7M bit/sec channel for each I/O module that supports two 5088s, Giacoletto said.

Since a network of FiberRing 100s can have a maximum of 28 I/O modules — each supporting 32 connections to a mainframe — up to 448 5085s can be linked to the mainframe.

The product costs $1,850 and is available 60 days after receipt of order.

Raycom Systems can be reached in writing at 6395 Gunpark Drive, Boulder, Colo. 80301, or by calling (303) 530-1620.

Vitalink, Halley upgrade systems

continued from page 31

time, has a printing facility for hard-copy laser printout of all the system graphics.

"I think we're right at the front of the pack with these tools," said Tim Lee-Thorp, network management product manager for Vitalink. With the release of the WANmanager 1.1, Lee-Thorp said he thinks Vitalink has more than a year's jump on its competitors.

Scheduled to ship in April, WANmanager 1.1 costs $10,000 for the first copy in a network and $5,000 for additional copies, which is about 30% more than the software's first-copy price for Version 1.0.

Halley introduced Version 1.1 of its ConnectView Ethernet Brouter Manager, which features data base management functions that provide users with the ability to define and store information about LANs as well as routers.

Halley also added new filters to the ConnectView Ethernet Brouter Manager that allow managers to scan the brouter's activity log selectively to spot traffic and usage trends in the network. Previously, managers had to examine brouter data manually to spot trends.

A new addition to Version 1.1 is the ability to compile information into bar chart and tabular form. The original version only displayed data in numerical sequence.

ConnectView runs on an IBM Personal Computer AT under Microsoft Corp.'s Microsoft Windows 286 Version 2.1.

The ConnectView Ethernet Brouter Manager software is available now and is priced at $2,495, which is the same as Version 1.0 pricing.

Bridge prevents spread of rare 'multicast storms'

WASHINGTON, D.C. — Vitalink Communications Corp. recently rolled out enhancements to its TransLAN III Ethernet bridge, including a feature that prevents rare yet potentially damaging "multicast storms" from spreading from one network to another.

Multicast storms occur when a computer or router malfunctions and floods the network with useless information. Such storms wreak havoc with network response times because they eat up available bandwidth and can hop across bridges to attached local-area networks.

The new Vitalink bridge can now be configured with a multicast traffic ceiling that suppresses the storm before it is forwarded onto another network.

"When you have a multicast storm, you want to isolate the problem to one LAN," said Jack Marsal, TransLAN product manager for Vitalink. "It's a rare problem, but when it happens, it can bring a network to a standstill."

The enhanced bridge has the ability to segment a network into separate bridged domains, which helps contain the storm to one sector. Once multicast traffic reaches a predetermined ceiling, the Vitalink bridge stops forwarding traffic to an attached network.

In addition, the TransLAN III now offers concurrent support for both the IEEE 802.1 Spanning Tree Protocol and Digital Equipment Corp.'s Spanning Tree Protocol. This way, users with the DEC implementation can bridge to a network supporting the standard protocol.

The enhanced TransLAN III Ethernet bridge is priced at $14,250 and is expected to be available in June. Vitalink said the new features for the Ethernet bridge will be available on all of the company's bridges and routers by the end of the year.

— *Walter Sweet*

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See the FAXNeT Form on Page #61

OPINIONS

CHARGEBACK SYSTEMS

BY MARVIN CHARTOFF

The secret to controlling network costs.

To better control costs in these days of belt-tightening, many companies are considering chargeback systems. However, chargeback systems are often perceived as being difficult to implement and not accurately reflecting departmental use of the network. To be effective, the system must be designed properly and implemented with the correct tools.

An effective chargeback system should use various cost-allocation measures, be driven by business needs and not by an available software tool, and be able to support major network moves or changes. The system should be reviewed annually to ensure that it meets performance criteria.

Network resources cannot always be directly attributed to single users or the traffic they generate. Many end users share T-1 multiplexers, local-area network servers, private branch exchanges and multidrop circuits. Yet, long-distance services from an interexchange carrier typically can be traced back to an individual or station set.

> Chargeback systems are often perceived as being difficult to implement.
>
> ▲▲▲

Allocating the costs for various resources requires a combination of usage-based measures, such as minutes per call or characters, and non-usage-based measures, such as head count or number of ports. When used in conjunction with a yearly estimate of required network resources and a budget for networking expenditures, the right combination of measures can provide a fair allocation of costs and motivate end users to control them.

Implementing a chargeback system requires a software program to collect cost data and perform the allocation function that best suits an organization's goals. Many vendors provide software that can serve as the basis for a chargeback system; some organizations develop in-house programs.

The chargeback system's success depends on having the software tool support the cost-allocation scheme, not dictate it. Too many managers fall in love with a system's bells and whistles rather than its functionality. The software tool must permit non-usage-based measures, encompass voice and data as well as local- and wide-area networks, adapt to changing organizational structures and provide timely information upon which decisions regarding network needs can be based.

The chargeback software tool must also be easy to use so that the administrative burden of entering data into the system and verifying its accuracy does not defeat the benefits of cost control — an area of major frustration in the past.

Data center moves, major net upgrades and new facilities must not result in unanticipated charges to users. Most major changes go through a significant planning cycle; therefore, estimated costs should be available before implementation. The chargeback administrators should budget for these charges, inform the affected departments of the need for a rate increase and allocate costs appropriately. The chargeback system should also permit the buildup of a surplus account to accommodate expenses that are hard to estimate. This approach is preferable to hitting the users later with large add-on charges.

Networks are now a major contributor to the success of a business. Just as other resources require monitoring of costs to ensure that dollars are spent wisely, so must network costs be accountable. With an effective chargeback system, organizations can achieve the necessary cost controls.

Chartoff is a senior manager at Network Strategies, a consulting practice of Ernst & Young located in Fairfax, Va.

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The Newsweekly of User Networking Strategies

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161 Worcester Road
Framingham, Mass. 01701
(508) 875-6400
MCI Mail — 390-4868

An IDG Communications Publication

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EDITORIAL

RBHCs should be allowed to provide info services content

Of the three line-of-business restrictions imposed on the regional Bell holding companies, the prohibition against entering the information services market is one of the most controversial today.

The RBHCs control the local loop, the principal electronic conduit through which information services are offered to local telephone exchange subscribers. Now they want to develop their own information services and provide them through their local network facilities.

But the American Newspaper Publishers Association (ANPA) vehemently opposes this, citing the regulatory tenet that no single player in any locality should control both the conduit and the content. ANPA argues that the RBHCs' control of the public network will give them an unfair advantage by enabling them to erect subtle, but effective, barriers to competition.

ANPA members' real fear, however, is not unfair competition, but competition itself. They want to prevent the RBHCs from dipping any further into the two principal sources of newspaper profits: display advertising and classified advertising.

In display advertising, the RBHCs have long been competitors of newspapers. Most local enterprises use both newspaper display ads and Yellow Page ads.

The RBHCs now want to offer electronic Yellow Pages — an on-line information service to help consumers determine which businesses serve which markets in which communities.

The RBHCs should be permitted to compete electronically in the display advertising market, provided, of course, that newspaper companies are permitted nondiscriminatory access to RBHC network facilities for the same purpose.

ANPA is even more deeply concerned about the RBHCs making potential inroads into the classified ad market. Newspapers traditionally have enjoyed a virtual monopoly on classified ads for jobs, as well as for houses, automobiles and other items commonly offered for sale by individuals. In fact, classified ads typically account for one-third or more of a newspaper's revenues.

Today, the seven RBHCs would like to collaborate to offer a nationwide, on-line classified ad service. Think about it. If you're moving and need to monitor housing prices in another region of the country, wouldn't it be convenient to do so by simply logging on and plugging in the parameters of your dream house? Whenever a house meeting your specifications came on the market in the geographic area you indicated, you would be notified automatically.

Who is better positioned to offer such a service than the RBHCs?

The RBHCs should also be permitted to compete electronically in the classified advertising market, provided, again, that newspaper companies and any other companies that want to compete are permitted nondiscriminatory access to RBHC network facilities for the same purpose.

The key term here is "nondiscriminatory access." As long as it costs RBHC competitors no more to offer electronic advertising services over the public network than it costs the RBHCs themselves to offer similar services over the same network, no problem. Let the competition begin.

The RBHCs are often castigated as monopolists because of their exclusive control of local-loop telephone facilities in most areas of the country. However, most U.S. cities are served by only one, not two, major newspapers, and in those cities, the newspaper publishers are just as monopolistic as the RBHCs.

Publishing companies and telephone companies should be permitted to compete for the advertising dollars of both businesses and individual consumers. And the cable companies should be encouraged to join the party too.

The more competition that exists in the information services market, the happier the consumers of such services will be and the sooner the long-heralded information age will truly arrive.

LANS

BY JOHN MCQUILLAN

Singing the incompatibility blues

Incompatibility is a major problem in the networking business today. Let's take the common situation of a local-area network with some IBM Personal Computer-compatible devices. The personal computer needs an operating system; your choices are DOS and OS/2.

The operating system you choose determines the graphical user interface. Under DOS, the leading operating system candidate is Windows; under OS/2, it is Presentation Manager. The choice of LAN operating system is also important. Good candidates include systems from Novell, Inc. and 3Com Corp.

Touted in the trade press as the future direction for personal computing operating systems, OS/2 offers multitasking and a complete graphical user interface compatible with IBM's Systems Applications Architecture. But very few application programs that run under OS/2 currently exist. The DOS Compatibility Box, an OS/2 facility, allows you to run DOS applications under OS/2, but this is not a very good solution. Like most users, your decision is made for you — you just go with DOS.

But now you must choose between DOS Versions 3 and 4. Most thoughtful people would view this as an easy choice and select Version 4. It has all the latest features, has been on the market for a year and is presumably mature and stable.

Surprise! Not all application programs run compatibly under DOS 4.0. The new version makes it possible to use disks with a much larger capacity, but not all older application programs can work in that environment. Also, DOS 4.0 doesn't support CDROM. Although Microsoft Corp. provided extensions to DOS 3.3 to support CDROM, and the company intends to support CDROM under 4.1, DOS 4.0 is an orphan in this regard.

So by process of elimination, you select DOS Version 3.3 as the least likely system to create compatibility problems. This choice restricts you to Windows — specifically, Version 2.11. Once you have brought up DOS 3.3 and Windows, you are in for your next set of disappointments: It is quite difficult to run Windows and a LAN operating system at the same time.

You can't run many of the most powerful, popular applications without problems. For example, Lotus Development Corp.'s Lotus 1-2-3 Release 3 — the latest version with three-dimensional spreadsheets — doesn't run under Windows.

> It is quite difficult to run Windows and a LAN operating system at the same time.
>
> ▲▲▲

When it comes time to choose your LAN operating system, you will encounter even more compatibility problems. Depending on your memory configuration and the set of applications you want to run, you will most likely encounter RAM cram — not all of your programs will fit into available memory.

Many LAN operating systems require 100K bytes or more of precious random-access memory, making it difficult or impossible to run certain applications together with various memory-resident utilities, sometimes called Terminate-and-Stay Resident (TSR) utilities. Several popular, powerful TSR utilities require that *they* be the last one loaded into memory.

New versions of DOS have a facility called FASTOPEN, which stores the disk addresses of frequently used files. Unfortunately, the new generation of LAN servers with caching disk controllers are sometimes incompatible with the DOS FASTOPEN command, so you must choose between disk caching and the FASTOPEN facility. You can't use both.

Naturally, there is a whole host of damage-control activities spawned by these problems. Utility packages are available that allow you to load some of your TSR utilities into high-memory address spaces outside of the 640K-byte address space limit. This gives you more RAM to work with and alleviates the RAM cram problem. Unfortunately, these tools are usually incompatible with Windows.

It is not an exaggeration to say that today, it is beyond the patience of most users to design, configure and install a LAN with the latest hardware and software, including graphical user interfaces and full-featured LAN operating systems. There are just too many incompatibilities.

There are two ways to solve these mounting compatibility problems. Some people think that all the problems are going to go away with the next generation of hardware and software; they point to OS/2 LAN Manager and similar products as salvation for the industry.

The other answer is to be found in the growth in the value-added reseller business. Put simply, configuring LANs has become so complicated that many users cannot do it for themselves. They must rely on value-added resellers to do it for them.

As the above recital of compatibility woes indicates, all the problems have to do with the trivial details of the latest releases of hardware and software from dozens of suppliers. Only a value-added reseller that is in the day-to-day business of installing these systems can keep up with the latest news of what is compatible with what.

I'm glad the value-added resellers have found gainful employment. But I'm sure many of us wish that the network business was a lot simpler. ■

McQuillan is president of McQuillan Consulting in Cambridge, Mass. He assists users and vendors in planning communications systems.

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TELETOONS

BY FRANK AND TROISE

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Here we see a member of our sales force out in the field demonstrating our latest marketing technique ..

LETTERS

The voice of reason

Hear! Hear! It is nice to know the voice of reason still exists in isolated areas. Ralph Brandt's column "Murphy is alive and well at some companies" (*NW,* Dec. 25/Jan. 1) hit the nail on the head.

Another cliche that people of this mind-set are fond of is, "If it ain't broke, don't fix it." Translation: "If you see a problem, don't even *think* of fixing it until it becomes a catastrophe," or perhaps "I am incapable of implementing change without causing a catastrophe."

So few people are willing to believe the maxims Brandt states that it would take an incredible leap of faith for them to even pay lip service to it, much less adopt it in practice.

Richard Hail
Data communications specialist
Hewitt Associates
Lincolnshire, Ill.

More about cellular

Daniel Briere's article ("Cellular service options merit close user scrutiny," *NW,* Jan. 15) neglected several significant aspects of cellular phone service. First, with regard to providers, there is no mention of resellers. These are companies that buy airtime wholesale from the carriers and retail it to users, usually along with phones.

There are distinct advantages to dealing with a reseller, such as Cellcom Corp., which operates in Los Angeles and New York. First, since resellers buy from both authorized carriers, dissatisfied users can switch without charge very easily. Second, resellers often offer more airtime options than the carriers.

There was no mention of antennas in the article. Through-the-glass antennas, which are easily installed in rear windshields without drilling any holes, are satisfactory in flat areas, such as Florida.

(continued on page 60)

Network World *welcomes letters from its readers.*

Letters should be typed, double-spaced and sent to Editor, Network World, *161 Worcester Road, Box 9172, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

Getting the message

EDI's alliance with the X.400 Message Handling System will promote connectivity.

By DANIEL BLUM

For centuries, adventurous people have stuffed paper messages into bottles and tossed them in the ocean, hoping that somehow the letter would land on a shore where its finder would be able to understand it and perhaps respond in kind.

Fortunately, modern messaging is not as random — nor does it necessarily involve paper. Electronic data interchange allows companies to exchange purchase orders, invoices and other information electronically. A strategic alliance between EDI and the X.400 Message Handling System (MHS), a multivendor bearer service, promises to increase the effectiveness and usage of electronic messaging even further.

The advantages of EDI have long been trumpeted throughout many industries. For some executives, the reduction in paperwork alone provides substantial justification for automation. Others look to the demonstrated advantages of quick response, a technique for reducing the need for substantial inventories, back orders or markdown sales by acquiring and analyzing transaction information scanned from the point of sale.

Blum operates OSI Migrations, an education and consulting company in Takoma Park, Md.

However, the diversity of noninteroperating computer equipment and software in the field often inhibits EDI service interconnection or forces would-be users to commit to a single vendor. Another limiting factor is the need for preauthorization agreements between communicating parties before electronic transactions can carry any legal weight.

The adoption of Open Systems Interconnection-based X.400 MHS as a bearer service for EDI will lift connectivity barriers. The 1984 X.400 recommendations have already achieved widespread international acceptance.

The anticipated arrival of Government OSI Profile specifications in August 1990 has spurred vendors and third-party software providers to implement X.400 and become eligible for future contracts. Pressure from users such as the Aerospace Industry Association expedited X.400 interconnection of existing electronic mail services.

Today, X.400 is a reality and can solve EDI's connectivity problems. But what about the legal factors involved in using electronic messaging for business transactions? Standards writers and users cannot update legal statutes themselves.

The reason for much of the present le-

(continued on page 40)

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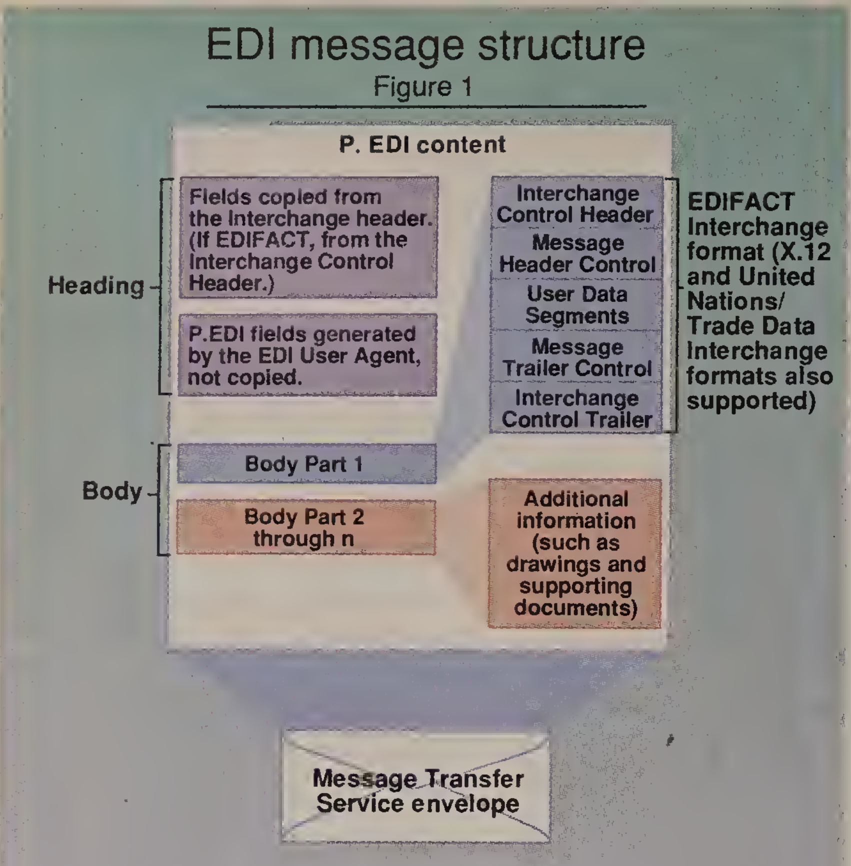

EDI message structure
Figure 1
P. EDI content
Heading
Body
Fields copied from the interchange header. (If EDIFACT, from the Interchange Control Header.)
P.EDI fields generated by the EDI User Agent, not copied.
Body Part 1
Body Part 2 through n
Interchange Control Header
Message Header Control
User Data Segments
Message Trailer Control
Interchange Control Trailer
EDIFACT Interchange format (X.12 and United Nations/ Trade Data Interchange formats also supported)
Additional information (such as drawings and supporting documents)
Message Transfer Service envelope

An EDI message consists of P.EDI content with a Message Transfer Service envelope. The content is made up of a heading and at least one body part. The interchange itself is contained in Body Part 1, with supporting documents, if any, contained in additional body parts. The Message Transfer Service contains addressing information about the message's originator and recipient, along with other service features.

GRAPHIC BY SUSAN SLATER

SOURCE: DANIEL BLUM, TAKOMA PARK, MD.

(continued from page 39)

gal vacuum is that until recently, electronic messaging has not been secure, standardized or even able to offer a consistent definition of service.

The 1988 version of the CCITT ISO X.400 standard, however, provides a detailed definition of service as well as commercial and near military-grade security provisions. These provisions include cryptographic techniques that are equivalent — indeed superior — to paper signing and sealing.

It is hoped that it is only a matter of time before electronic encryption and digital signatures are legitimized by the legal and legislative communities.

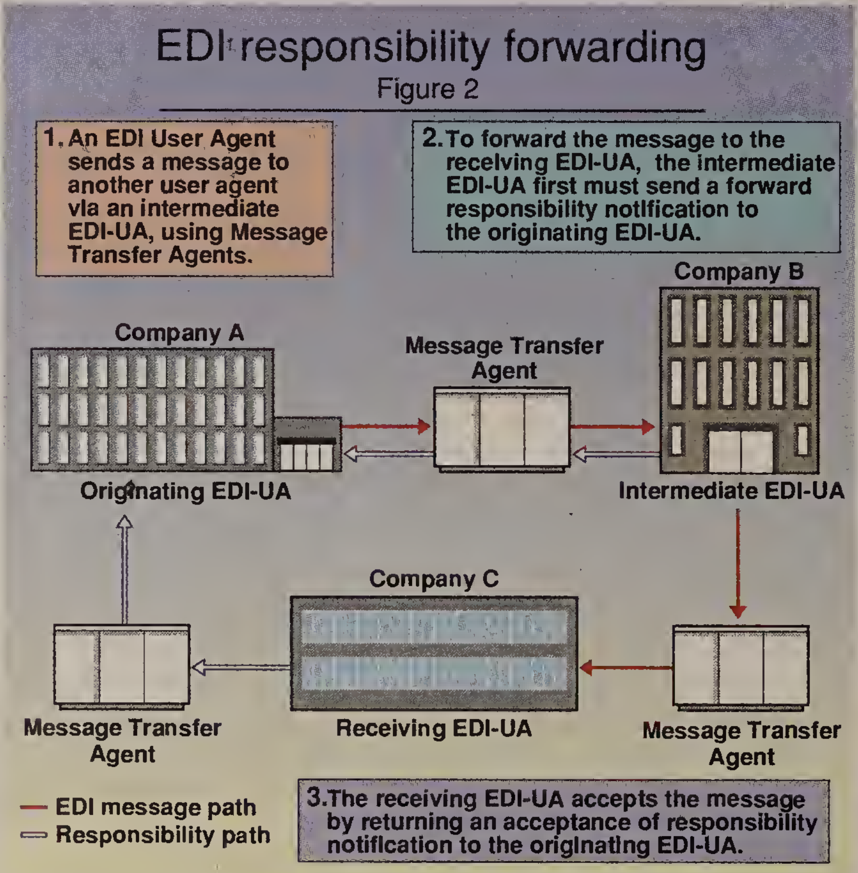
Other important MHS capabilities are the ability to use postal addressing to generate hard copy of any message and access to OSI's X.500 Directory Services. Directory Services may be used to store information about peer system or user capabilities and even contractual agreements.

Over time, widespread interconnection of EDI applications using X.400's advanced features may achieve sufficient critical mass to mandate the statutory changes needed without imposing overly cumbersome preauthorization requirements.

Standardizing X.400 use

The obvious prerequisite for standardizing EDI use is for standards makers to agree on how EDI will use X.400 and X.500. An associate rapporteur group, named EDI & X.400, was formed last year under the auspices of CCITT Question 18 Study Group VII. The participants represent a mix of X.400 experts and members of the EDI user community, including EDI standards organizations, industry groups and user organizations.

Due to the perceived urgency of the topic, work began early in 1989 under accelerated procedures targeted to produce CCITT recommendations by late 1990, with extensions to follow at the completion of the CCITT's 1992 study period.


EDI responsibility forwarding
Figure 2
1. An EDI User Agent sends a message to another user agent via an intermediate EDI-UA, using Message Transfer Agents.
2. To forward the message to the receiving EDI-UA, the intermediate EDI-UA first must send a forward responsibility notification to the originating EDI-UA.
Company A
Originating EDI-UA
Message Transfer Agent
Company B
Intermediate EDI-UA
Company C
Receiving EDI-UA
Message Transfer Agent
Message Transfer Agent
— EDI message path
⇨ Responsibility path
3. The receiving EDI-UA accepts the message by returning an acceptance of responsibility notification to the originating EDI-UA.

GRAPHIC BY SUSAN SLATER

SOURCE: DANIEL BLUM, TAKOMA PARK, MD.

Two draft CCITT recommendations are currently under development — X.EDI1/F.430 Message Handling: EDI Messaging: System and Service Overview; and X.EDI2: Message Handling Systems: EDI Messaging System.

At the most recent meeting held in October in Rennes, France, the deliberations progressed well, according to Ted Myer, CCITT associate rapporteur and chairman of Palo Alto, Calif.-based Rapport Communications, Inc.

"I'm quite satisfied with the way it turned out," Myer says. "There are no glaring holes, and we've achieved more than the minimal functionality." Two 1990 meetings are already scheduled for March 5 to 9 in Dallas and June 6 to 15 in Switzerland.

Scope and architecture

The EDI & X.400 group's earliest decisions concerned scope. For the purposes of the agreements, EDI needed to be defined. Potentially, the term covers multiple modes of transfer for multiple classes of objects.

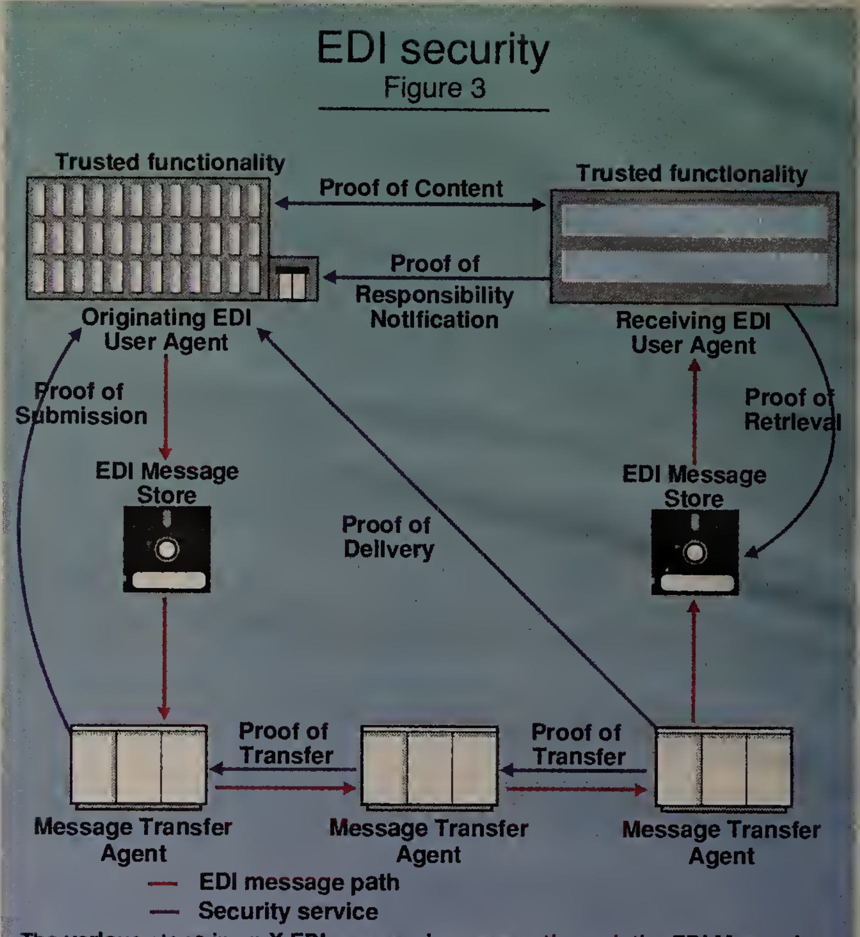
Should interactive modes of transfer be addressed? How about highly structured objects including, but not limited to, data bases of computer-aided design, manufacturing and engineering drawings? The group finally agreed to focus on store-and-forward exchange of trade data, as defined in the EDI for Administration, Commerce and Transport (EDIFACT), ANSI X.12 or United Nations/Trade Data Interchange (UN/TDI) standards.

The next major issue was architectural. Should EDI/X.400 be offered over X.400's Interpersonal Messaging (IPM) service, or should it go a level deeper and run directly over X.400's generic Message Transfer Service? According to Myer, after intense debate, the group reached a consensus to adopt the Message Transfer Service solution.

"There was an interlocking set of major reasons," Myer says. "Some IPM features necessary for EDI were absent; other features were irrelevant to EDI. The [Message Transfer Service] is designed to handle multiple applications. Also, the IPM service is end to end, whereas EDI extends across multiple hops."

EDI/X.400 was given a separate slot in the Message Transfer Service board and, along with that, its own protocol name, P.EDI. Other high-level architectural decisions followed: X.EDI specifies a custom EDI User Agent (EDI-UA) and a custom EDI Message Store (EDI-MS). However, it does not specify any access units over and above the stable of access units already available through X.400.

EDI-UAs originate and receive messages containing content encoded in the P.EDI format. As shown in Figure 1 on this page, an EDI/X.400 message consists of a Message Transfer Service envelope and P.EDI content. The envelope contains addressing information about the originator and recipient of the message, as well as numerous other Message Transfer Service options.


EDI security
Figure 3

The various steps in an X.EDI message's passage through the EDI Messaging Environment can be protected from security threats using security features such as Proof of Content, Proof of Delivery and Proof of Retrieval.

GRAPHIC BY SUSAN SLATER

SOURCE: DANIEL BLUM, TAKOMA PARK, MD.

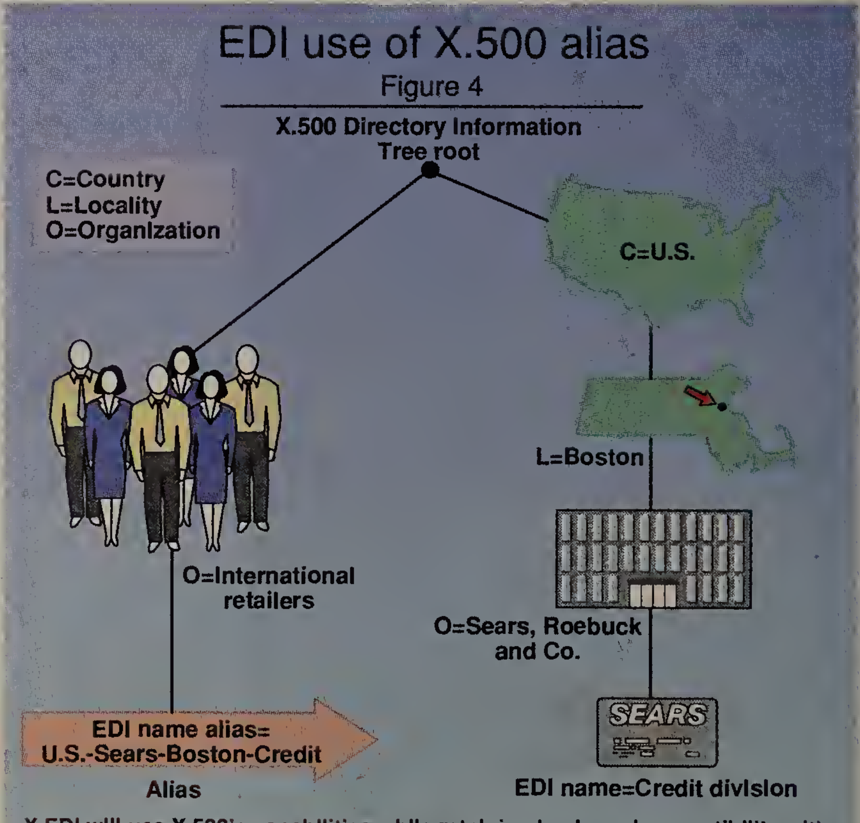
The P.EDI content consists of one heading and multiple body parts. The first body part of the content is the EDIFACT interchange. (P.EDI supports X.12 and UN/TDI formats as well, but leans toward EDIFACT in its terminology.)

Selected fields of the EDI interchange header itself map into the P.EDI content heading, which is encoded according to the rules of OSI's Abstract Syntax Notation (ASN.1). This heading contains originator/recipient specifications and associated options, message identification fields, message context options that may associate the current message with related messages and numerous other service features such as indications of priority or sensitivity.

The entire EDI interchange maps into Part 1 of the P.EDI content body. Additional body parts may consist of other user data, such as supporting documents and drawings.

The EDI-MS is a repository for interchanges that need to be routed through a clearinghouse or

(continued on page 42)


EDI use of X.500 alias
Figure 4

X.EDI will use X.500's capabilities while retaining backward compatibility with earlier EDI naming conventions. The alias, or pointer entry, allows applications to access the EDI user using the old-style EDI user name form rather than an X.500 user name form. Other X.400 or X.500 applications would reach the EDI user through the C-L-O path.

GRAPHIC BY SUSAN SLATER

SOURCE: DANIEL BLUM, TAKOMA PARK, MD.

ON APRIL 27, SOME OF THE BRIGHTEST MINDS IN THE COMPUTER INDUSTRY ARE GOING TO GET FIRED.

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Dr. David Nelson

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(continued from page 40)

some other central point in an organization.

Among the EDI-MS capabilities are maintaining a message data base, allowing sophisticated searches and performing automatic forwarding, discarding or alerting functions for the user based on the identification of the message originator or other factors.

Unfortunately, because none of the existing EDI formats are encoded in OSI's ASN.1, only those interchange elements that map into the P.EDI content heading can be fully standardized for use by the EDI-MS.

EDI responsibility concept

In the EDI environment, a number of service providers may offer commercial services. The EDI-MS, and sometimes the EDI-UA, forwards the EDI message. To provide for legal protection of users and service providers, the EDI & X.400 group decided to implement an EDI notification protocol element to trace the path of responsibility for an EDI message through the EDI Messaging System.

The originator of an EDI message can request an EDI notification from the recipient, which must then return an EDI notification accepting, refusing or forwarding responsibility for the subject message. One scenario is shown in Figure 2 on page 40.

Some aspects of managing responsibility have already been worked out. If an EDI-UA or EDI-MS rejects responsibility for a message, it must thereafter ignore the message. If it has modified the message content, it must accept responsibility prior to forwarding the message.

As in any distributed forwarding scenario, loop detection and other machinery is needed and interesting pathological cases can arise. For example, what does a recipient EDI-UA do if, after forwarding a message onward and notifying the originator of forwarded responsibility, it then receives a nondelivery notice for the forwarded message from the Message Transfer Service? X.EDI work in this area remains sketchy; some debugging will be necessary at future meetings.

EDI security

The X.EDI documents soon will contain information on security and EDI use of Directory Services. Regarding security, X.400 contains the necessary machinery for both data confidentiality (through encipherment) and data integrity (through digital signatures) using, as appropriate, either symmetric (secret key) or asymmetric (public key) cryptographic algorithms.

The protocol P.EDI uses this machinery to produce a spectrum of security services such as Proof of Message Submission and Proof of Message Delivery. These and other capabilities will be used in X.EDI, for example, to assure a billing department that a customer cannot deny receipt of an invoice.

However, the X.400 security features are specified as optional in the standard. Especially during the early years of EDI/X.400 interworking, many Message Transfer Agents (MTA) — transfer points between EDI-UAs and EDI-MSs — in the field will support only the 1984 X.400 functionality. Thus, for an EDI message passing through multiple MTAs in the Message Transfer Service, security may not be available at all points.

X.EDI experts propose to use existing X.400 security mechanisms to add new overarching security services that will provide protection even if weak links are found in the underlying Message Transfer Service connectivity chain. These new services, which may be added at the P.EDI protocol level, are called Proof of Content and Proof of Responsibility Notification.

> Regarding security, X.400 has the machinery for data confidentiality and data integrity.
>
> ▲▲▲

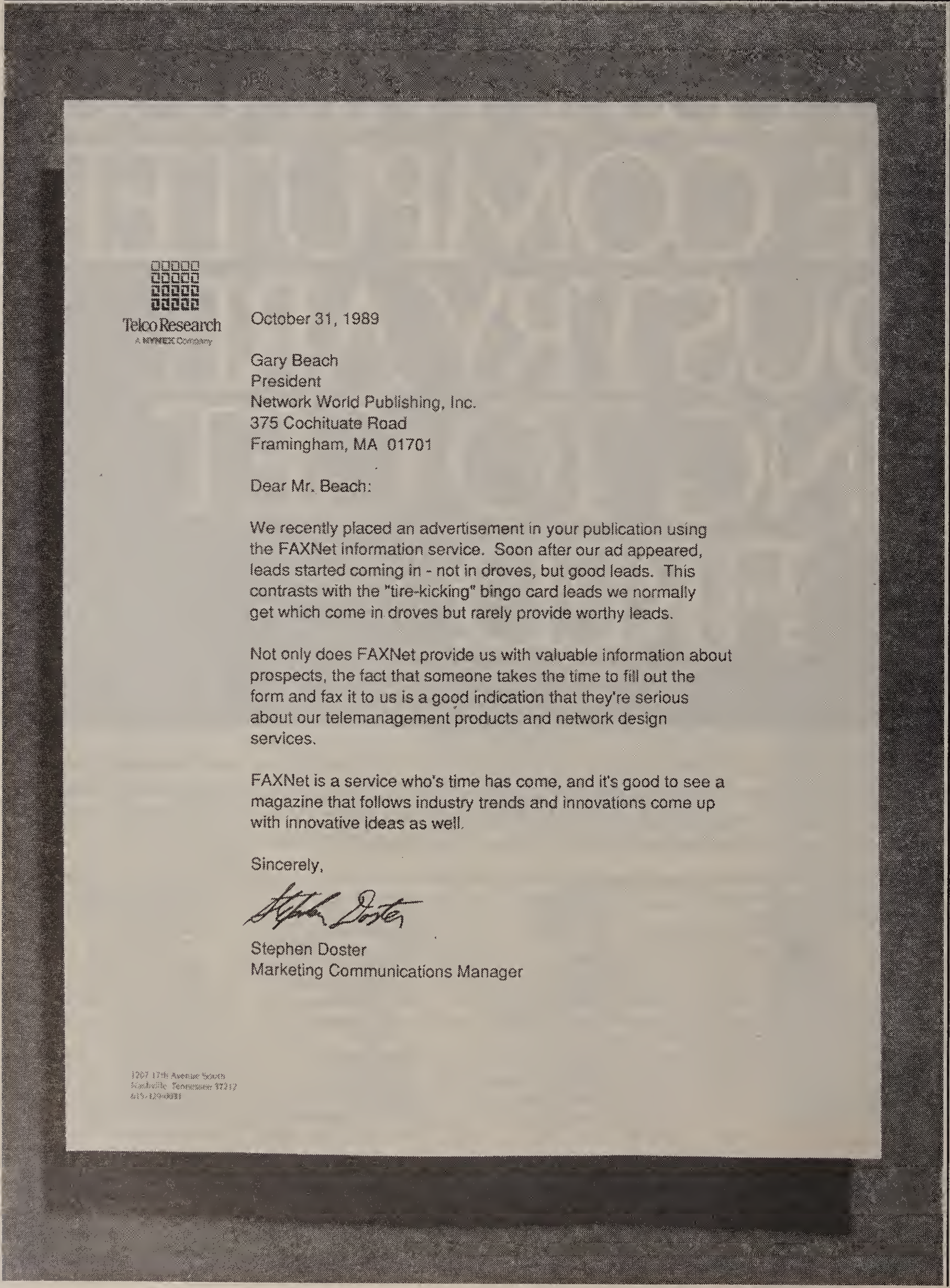
Beyond conformance issues, a few remaining deficiencies in the X.400 security apparatus itself must be remedied. Unfortunately, X.400 does not provide for Proof of Retrieval from an EDI-MS or for Proof of Transfer between MTAs. The EDI & X.400 group members took a hard-nosed look at the problem and have requested that other groups now in the process of creating the 1992 X.400 series of recommendations correct these problems.

Figure 3 on page 40 shows how every step of an EDI message's passage through the EDI Messaging Environment can be secured against various security threats.

The sending EDI-UA receives Proof of Submission from its MTA. Each relaying MTA receives Proof of Transfer from the following MTA. The last, or delivering, MTA provides Proof of Delivery to the sending EDI-UA. The receiving EDI-MS receives Proof of Retrieval from the receiving EDI-UA, which also provides Proof of Responsibility Notification to the sending EDI-UA. At the highest level, the EDI applications exchange Proof of Content.

Also on X.EDI's wish list are facilities for Secure Message Store Audit Trail, Secure MTA Audit Trail, Message Store Archive, Messaging Domain Archive, and Security of MTA Management and Routing Information. These security services will probably be added as part of a network

(continued on page 57)



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October 31, 1989

Gary Beach
President
Network World Publishing, Inc.
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Framingham, MA 01701

Dear Mr. Beach:

We recently placed an advertisement in your publication using the FAXNet information service. Soon after our ad appeared, leads started coming in - not in droves, but good leads. This contrasts with the "tire-kicking" bingo card leads we normally get which come in droves but rarely provide worthy leads.

Not only does FAXNet provide us with valuable information about prospects, the fact that someone takes the time to fill out the form and fax it to us is a good indication that they're serious about our telemanagement products and network design services.

FAXNet is a service who's time has come, and it's good to see a magazine that follows industry trends and innovations come up with innovative ideas as well.

Sincerely,

Stephen Doster

Stephen Doster
Marketing Communications Manager

1207 17th Avenue South
Nashville, Tennessee 37212

900 SERVICES

Dialing for dollars

CONTINUED FROM PAGE 1

by using a push-button phone (see "A 900 services glossary," page 47). Along with these interactive services came new equipment and connection options that, for the first time, allow true corporate applications over 900 services.

Some corporate telecommunications managers have been leery about implementing large-scale 900 programs due to public association of 900 with pornography and other questionable programming — much of which is actually associated with 976 services. Actually, 900 services are the long-distance counterparts of the local exchange carrier 976 services.

In the most successful corporate uses of 900 services, this stigma was overcome by the reputations of the providers themselves. The National Aeronautics and Space Administration, for instance, has a successful program in which callers listen to communications between NASA and its space shuttles.

Slowly and cautiously, corporations are adding 900 services to their lists of revenue-producing products. Each month, users come up with new applications to make use of these profitable services, but the process seems to have more than its share of failures. Setting up a 900

(continued on page 44)

Briere is president of TeleChoice, Inc., a Manchester, Conn., telecommunications consultancy specializing in long-distance service analysis and network design. He can be reached at (203) 645-0471.

CHART • GUIDE

Two *Network World* Buyer's Guide charts comparing the features and prices of various 900 services can be found on pages 48 and 56.

Savvy and judicious use of the most recent innovations in 900 services can garner big bucks for your company.

(continued from page 43)

application is tricky and wrought with potential catastrophe.

The most significant single fact about 900 services, also commonly referred to as audiotext services, is that they are pay-per-call services. Callers are charged a certain, predetermined amount each time they dial the 900 number — the opposite of 800 services, in which the called party pays for the call.

Charges for 900 calls are included with the caller's monthly local telephone bill. Once collected, these revenues are split between the carrier and the information provider. Companies that offer 900-number programs are generally referred to as information providers or sponsors.

The 900 services industry is based on the simultaneous access of thousands of callers to the same message. They provide any of four major types of audiotext services: passive, interactive, polling and conferencing.

Services are passive or interactive, depending on whether the program is designed to take input from the caller. Passive applications are typically limited to information distribution programs, while interactive applications often require give-and-take with the caller.

In addition, 900 services may simply poll callers for one or two responses, typically "yes" or "no," depending on which 900 number they call. The services may also link callers for simultaneous conversation — the so-called Group Access Bridging (GAB) lines.

The 900 network

Unlike most 800 numbers, 900 numbers are constantly changing hands. Often, programs are onetime applications. When they are completed, the number shifts to another customer or application. For this reason, no formal public 900 directory exists. Other 900 numbers, such as the *Wall Street Journal's* 900-JOURNAL or American Express Information Services Co.'s 900-WEATHER line, are more permanent.

To access a 900 program, callers simply dial 1-900-NXX-XXXX. As with 800 calls, when the 900-NXX-XXXX number passes through the local central office, the switch screens the first six digits (900-NXX) and routes the call to the long-distance carrier to which the NXX is assigned. The interexchange carrier transports the call to the information provider's processing equipment, which can be owned by either the information provider or service bureau.

Image problems

Because 900 service is still a developing technology, many people do not know what 900 numbers are. A recent survey of 12,000 people by Advertising Research Corp. and Strategic Telemedia showed that 55% of this nation's callers have never heard of 900 numbers. In fact, 95% of the nation's populace has never dialed a 900 number.

Those users who do know what a 900 number is are often confused about what the service provides. According to the survey, those who use 900 numbers on a regular basis are unable to associate a single purpose to the service, although polling and personal entertainment are mentioned frequently.

In some ways, the 900 industry is recovering from its earlier bad image. The first programming concentrated on pornography, group talk and children's topics — each of which brought public scorn but have been immensely profitable.

Setting up a corporate policy for using 900 and 976 numbers

There are many horror stories circulating concerning corporate abuses of 900 and 976 numbers. According to Telesphere International, Inc., 40% of the calls to its clients' horoscope lines originate at a business.

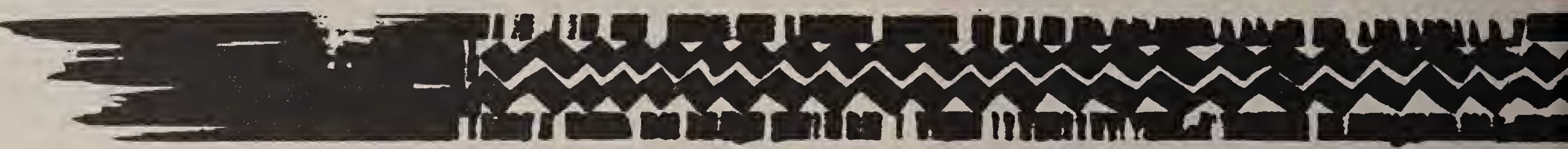
To curb such abuse, many companies have instituted blocking policies that prevent employees from dialing these numbers. Unfortunately, the blocking policies that have been established will also prevent employees from using the corporate-oriented 900 and 976 numbers that are currently available.

If you are blocking 900 and 976 calls through a private branch exchange, you should consider selective blocking. For example, you could:

- Selectively block 900 and 976 through adjunct boxes, which are devices that attach to home or office phones. These devices, which generally cost less than $100, can be programmed to block 900 and other toll numbers unless the caller inputs a four-digit access code before dialing.
- Selectively block 900 and 976 through your PBX. Use the PBX or available hardware to block all but certain necessary 900 numbers. Many companies first use three-digit screening to universally block all 900 numbers. Six-digit, or more effective 10-digit, screening will allow the PBX to look at each call as it comes through the switch to determine if it is an approved 900 number.

Build the routing tables so that only desired numbers get through. Establish approval procedures that let employees know they can have access to these services if they can justify the expense on a departmental level.

— Daniel Briere



Corporations installing 900 numbers today must not only cope with this reputation but will encounter other barriers as well. For example, replacing an 800 number with a 900 number tells customers the company is now charging them for a service that was previously provided for free. This may cause the company to lose customers, canceling any possible profits the 900 service might bring in.

Why 900?

Despite the problems, there is a lot of money to be made through smart use of 900 numbers.

The applications for 900 services are truly diverse. Many companies are drawn to 900 services as a replacement for 800 service since 900 shifts the cost burden to the caller. For example, companies may provide customers with access to an 800 number during their warranty period and a 900 number thereafter.

Other companies look to 900 services to provide marketing information about their customers for internal use. These services are playing an increasingly important role in television programming, for instance.

In late 1987, Music Television (MTV) first used 900 service as a replacement for postcards in a contest because there was too little time for mail to reach the station. MTV was overwhelmed when nearly one million callers dialed the 900 number.

Companies can also use 900 services to offer enhancements to products or services with minimal capital outlays. For example, a poultry farmer could use a 900 number to offer customers recipes.

Moreover, 900 services could be mixed with other existing technologies to yield added value to callers. For instance, amateur auto mechanics could call a 900 number for help in repairing a car. They could listen to messages and work through various menus until they found the appropriate information. Then they could receive full supporting diagrams and instructions for repair via facsimile.

This kind of direct interaction can bolster customer loyalty and increase corporate presence. MTV's usage of 900 services to control programming has enhanced viewer involvement with the show and created more loyalty. This, in turn, generates profits when selling advertising space because MTV can point to such audience involvement.

Finally, 900 services provide important marketing indicators for service and product development. By tracking customer response through 900 services, companies can combine revenue-generation with product development.

As with 800 services, captured automatic number identification allows each call to be matched with a data base of names and addresses to build targeted mailing lists.

For these reasons, 900 services are gradually gaining acceptance. Credit also must be given to the carriers for pushing the market in this direction. Sprint Gateways and Telesphere Communications, Inc., for instance, will not accept any adult, GAB or other programming that would reflect unfavorably upon the company. Other carriers are following suit.

Carrier services limited

Only five providers of 900 transport services now exist — AT&T, MCI Communications Corp., Sprint Gateways, Telesphere and Allnet Communication Services, Inc. Of these, MCI's product is in the final stages of beta testing and is not available to the general public, and Allnet's is a regional service covering only five states (see the accompanying chart on page 48 for a comparison of services).

Carrier services are divided into two groups — basic transport services and enhanced service bureau-like processing services. Each of the five carriers offer a basic 900 service that provides for the transport of the call through the interexchange network, the billing of that call either by the carrier itself or through the local exchange carrier and the collection of the revenues from the local telephone company.

Each carrier also offers some type of enhanced 900 service that includes the equipment and processing of the 900 program. Enhanced processing includes the programming of the message, the provision of the equipment on which to play it and any other special handling of the calls as they enter the carrier's domain.

Sprint Gateways was set up exclusively to offer these basic transport and enhanced processing services to the 900 industry. AT&T and American Express have started a joint venture called Call Interactive, Inc. to provide interactive voice services.

AT&T is also gearing up its Enhanced Services Complex, which will provide for simple storage of messaging and transport of the call. Telesphere and Allnet use Ameritech 900 Services to provide enhanced processing. MCI is using several service bureaus for the distribution of its basic 900 service.

AT&T has been offering 900 services for almost 10 years — longer than any other carrier. AT&T's 900 product line, originally called Dial-It 900, last year was renamed MultiQuest.

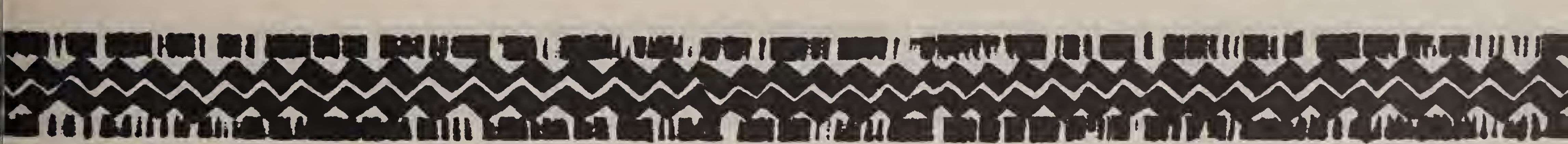
Long-distance carriers are not the sole source of 900 services, however. They are outnumbered by more than 100 noncarrier service bureaus that specialize in providing enhanced 900 service based on resold carrier 900 basic transport services.

In fact, most current information providers use a service bureau for processing 900 programs. While the carriers are trying hard to move into the service bureau market with their enhanced processing services, they now predominantly sell only transport, billing and collection services to the service bureaus themselves.

In many ways, service bureaus are better positioned to sell 900 services than carriers — they have more experience. Perhaps the biggest selling point of the service bureaus is their experi-

(continued on page 46)

Recently, the finest names in networking were put to the test.



(continued from page 45)

ence and comfort in dealing with both 800 and 900.

For years, these companies have specialized in incoming call management, including all of the application-specific and custom-designed networks that this implies.

The level of service they provide is unrivaled by any of the carriers, which is why most sponsors go to a service bureau for their application.

This makes it difficult to compare service bureaus with one another. It is similar to comparing advertising firms: While their past campaign successes are important, it is the individual application at hand that really matters.

Service bureaus resell the five carrier 900 services. Typically, the bureaus are reselling the basic transport, billing and collection services of the carriers. Because they already have the equipment in place, they provide the call processing enhanced services themselves. Most service bureaus resell more than one carrier's services, but few sell them all.

For each application, the bureau will choose among the existing service providers and in-house equipment to get the best combination of end-to-end functionality.

Choosing your 900 carrier

Getting a 900 number started involves choosing a carrier and service bureau if you do not have equipment of your own. These are not necessarily independent decisions — picking a carrier will most likely limit the choice of service bureaus, and picking a service bureau can often limit the choice of carriers.

Choosing a long-distance carrier for a 900 service often involves simply eliminating carriers that cannot do what is needed. Among the more important factors to consider when picking a carrier are:

- **Program content.** As mentioned previously, certain carriers will not carry calls for either children's or adult programming. Sprint Gateways and Telesphere, for instance, both heavily scrutinize all such programming and may decline to offer service.

Along the same lines, AT&T has set up premium billing guidelines that each program must meet in order to be accepted.

AT&T is also working with the Better Business Bureau's Children's Advertising Review Unit to provide guidelines for children's programming. Some of these include a $4 limit per call and a provision that call rates be presented both on screen and verbally in television advertising spots.

- **Processing time.** The time it takes for a carrier to initiate service can vary. Typically, AT&T and MCI take two weeks or more; Sprint Gateways, Telesphere and Allnet take less than two weeks. In many instances, setting up 900 service through a service bureau may take only five days.

- **Capacity.** In most literature, the capacity numbers quoted are meaningless because the basic assumptions are so outlandish. In an extreme case, a carrier might say, "If there is no other traffic on my network, then I could complete X amount of calls."

Capacity is directly related to the application and, in most cases, is important for high-volume response applications such as polling.

> Most service bureaus resell more than one carrier's services, but few sell them all.
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Capacity can be a local constraint as well as a network constraint. If local access is not available, then network bottlenecks may not even come into play. If a sponsor is expecting very high traffic volumes in a short period of time, then certain carriers may not be options.

High-volume applications require specialized solutions. A carrier may have to link several service bureaus to achieve the desired throughput. Regardless, be sure to get firm commitments from carriers because this issue always tends to be a gray area.

- **Equal access.** Surprisingly, equal access is a major issue with 900 services. Without equal access, a carrier cannot receive automatic number identification with calls. Without this information, the carrier must have a recording agreement with the local telephone company; otherwise, the carrier cannot bill for calls.

Because AT&T has direct connections to all end offices, it has an advantage over other carriers, which must wait for access to become available at each end office. This may or may not be important, depending on an information provider's target audience.

According to AT&T, more than 23% of the nation's exchanges are not converted to equal access yet. The standard answer by AT&T's competitors is "Well, only the least populated portions of the U.S. are not converted; the vast majority of callers are covered by equal access." This is not entirely true though. Consider, for instance, that 40% of New York City's central offices do not have equal access. Equal access covers Manhattan but none of the boroughs.

AT&T's competitors can accept calls from the non-equal access locations, but depending on what agreements are in place with the local telephone company, they may not be able to bill for the calls.

Each carrier deals with the problem differently — Sprint Gateways accepts nonbillable calls and absorbs these costs as part of its operating expenses, while Telesphere, Allnet and MCI block such calls.

In LAN Magazine's famous Drag Race, over forty LANs ran flat out in a contest of speed and endurance.

*Total test field comprised 47 entrants.
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- **Vanity phone numbers.** Since the local exchange carriers can provide only six-digit screening, each carrier can sell only those exchanges allocated to it by Bell Communications Research. A sponsor that wants a particular phone number may find its choice limited to a single carrier.
- **Pricing flexibility.** AT&T is the only carrier that has fixed pricing per exchange. All other carriers provide flexible pricing, regardless of the exchange. To change the rate charged, an AT&T user must change the 900 number. AT&T says it intends to alter this pricing limitation sometime in the first half of this year.
- **Disbursement of funds.** Most carriers say that paying out funds from 900 numbers takes 60 days, but sometimes reimbursement can take up to 90 days, depending on the billing cycle. While this may not help a sponsor choose among carriers, it is certainly important in determining cash flow needs.

Check out written terms and agreements. Get the carrier you choose to put details about its disbursement period into writing.

- **Carrier billing guidelines.** Some carriers have rate ceilings that may be charged on particular calls. For example, a sponsor that wants to charge $50 per call may find that a carrier with a rate cap of $10 per call is not a good choice.
- **Intrastate calling limitations.** Certain carriers, notably AT&T, may have problems completing intrastate calls when the caller is in the same state as the information processor. Calls may be blocked for much of the target audience. Check the intrastate carriage capabilities of each carrier.
- **Specialized management reporting.** Some carriers provide more enhanced call detail and traffic analysis reports, giving information providers more data about who is calling and from where. Ask for sample reports and custom billing options.

Pricing often matters very little in the overall decision. If there are still multiple carrier services left to eliminate after all other factors are taken into consideration, then pricing becomes a factor. However, rarely does price alone determine which carrier a customer will use for the transport portion of the 900 call.

Check out service bureaus

When selecting a service bureau, future information providers should consider:

- **Competitive potential.** Sometimes there is a possibility that the service bureau could be a competitor. If a service bureau has its own 900 programs, make sure they aren't similar enough to your own to cause problems if your program succeeds.
- **Ownership of 900 lines.** Does the service bureau or information provider actually own the 900 lines? Some service bureaus rent their own 900 lines to information providers. This can be dangerous if a program is successful and the service bureau starts raising prices or decides to provide the 900 program itself.
- **Availability of carrier services.** If only one carrier is available from the service bureau, is it the one that can best suit your needs? The broader the selection of carriers, the more flexibility you will have in the long run.

The ability to switch among different carrier services is now limited. Until the local exchange

(continued on page 48)

A 900 services glossary

- **Bad debt** — Lost profits due to uncollectable charges. Typically, a carrier will charge an extra percentage or per-call fee to cover bad debt from 900 programming.
- **Barge in** — Also known as "listen in," this form of 900 service allows callers to dial into an ongoing message or program. A popular usage is with Group Access Bridging (GAB) lines, in which several people are speaking on the lines at once (see GAB).
- **Billing** — In 900 jargon, this is actual end-user billing for the 900 call. AT&T provides its own end-user billing; other carriers use local exchange carrier billing.
- **Collection** — The collection of revenues from 900 end users. Collection is usually provided with billing service.
- **Dual-Tone Multifrequency (DTMF)** — A signal-generation scheme used by push-button telephones that makes the same beeps used in push-button service.
- **GAB** — Allows 900 carriers to link several lines at once, permitting group calling sessions.
- **Information provider** — The sponsor of a 900 service, this company provides the content to an information service by using either voice or text formats.
- **Interactive** — Applies to those 900 services that can accept DTMF signaling from the caller. This allows callers to control their interaction with the 900 service program.
- **Passive** — Applies to those 900 services that do not allow any interaction with the caller. The person dialing into the 900 program can only listen to the program.
- **Polling** — A 900 application that allows callers to dial into one of two passive 900 numbers or one interactive 900 number to quickly express a view on an issue.
- **Transport** — That portion of the cost of a call that pertains only to the carriage of the call by a carrier. This is separated from the billing and collection services for which a carrier may charge.

— Daniel Briere

The result? AT&T StarLAN 10 blew out everything in its class.

And its class is pretty classy—all the Ethernet® names tested (including Racal-InterLan and Everex™) ate our dust. So did every Arcnet entry, and a host of Token Rings (IBM® among them). All told, AT&T StarLAN 10 outstripped forty-four challengers* en route to a Winner's Circle Trophy in the *LAN* Drag Race.

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AT&T
Computer Systems

Basic 900 service offerings

Company	Product	Service type	Coverage	Installation fees	Monthly fees	Call increments	Transport rates (per minute of usage)	Volume discounts	End-user rates	End-user rate caps	Billing charges	Bad debt handling (6)	Settlement
Allnet Communication Services, Inc. **Birmingham, Mich.** **(313) 354-7000**	Market Reach (Network Pricing Option)	Passive and interactive information, polling	Mich., Wis., Ill., Ohio and Ind.	Order fee, $1,000; installation, $0	$750 for first number, $175 for each additional number	6 sec subject to 60-sec minimum	To dedicated lines: usage fee for first minute, $.32; additional minute, $.25; to business lines: usage fee for first minute, $.39; additional minute, $.32; $.12 per call surcharge	Basic: 5%-20% based on volume	Flexible (sponsor determines end-user pricing)	None	Included in cost	Minimum 7%	60 days
AT&T **Basking Ridge, N.J.** **(800) 222-0400**	MultiQuest	Passive and interactive information	50 states	Order fee, $0; installation, $1,200 for first number, $175 for each additional number	$1,000 for first number, $125 per additional number, $50 per additional routing arrangement	1 min, subject to 1-min minimum	First minute, $.30; additional minutes, $.25	Basic: $0-$100,000, 0%; $100,000-$200,000, 5%; $200,000+, 10%; term plan, Revenue Volume Pricing Plan	Fixed (exchange determined)	$50 per call or $10 per minute (on $10 initial minute)	10% of total call cost	None	60 days
	MultiQuest Hi-Cap	Passive and interactive information	50 states	Order fee, $0; installation, $1,200 for first number	$1,000 for first number	1 min, subject to 1-min minimum	First minute, $.30; additional minutes, $.25; $.06 per call surcharge; $.035 per call surcharge for each ineffective call attempt	Basic, $0-$100,000, 0%; $100,000-$200,000, 5%; $200,000+, 10%; term plan, Revenue Volume Pricing Plan	Fixed (exchange determined)	$5 per call or $2 per minute	10% of total call cost	None	60 days
	MultiQuest Broad-caster	Passive	Basic service,50 states plus more than 80 foreign countries; premium service, 50 states only	Order fee, $0; installation, $250 per channel	None, subject to 1,000-call minimum average monthly (7)	1 min, subject to 1-min minimum	First minute, $.45; additional minutes, $.35	Basic, $50,000-$100,000, 10%; $100,000-$200,000, 20%; $200,000+, 23% (8)	Fixed (exchange determined)	$25 per call	13% of total call cost minus transport costs	None	60 days
	MultiQuest Call Counter	Polling	Basic service, 50 states plus more than 80 foreign countries; premium service: 50 states only	Order fee, $0; installation, $0	$25 per day for first number; $8 per day for each additional number, subject to a 500-call minimum average monthly (7)	1 min per call	$.50 per call	Term plan, Revenue Volume Pricing Plan; promotional compensation scale (2)	Fixed (exchange determined)	$10 per call	13% of total call cost minus transport costs	None	60 days
MCI Communications Corp. **Washington, D.C.** **(202) 872-1600**	MCI 900	Passive and interactive information, polling	48 contiguous states plus Hawaii (4)	Order fee, $0; installation, $0	$0	6 sec subject to 60-sec minimum	All minutes, $.40	0-250,000 min, 0%; 250,000-500,000 min, 8%; 500,000+, min, 15%	Flexible (sponsor determines end-user pricing)	$10 per call or $2 per minute	Included in cost	4% surcharge	60 days
Sprint Gateways **Shawnee Mission, Kan.** **(800) 735-5900**	Network 900	Passive and interactive information, polling	50 states (4)	Order fee, $1,500 per account; installation, $0	$1,000 for first line, $100 for each additional line; program storage fee includes first 10 min of storage per month; additional storage is $.025 per minute per port	1 min, subject to 1-min minimum	First minute, $.35; additional minutes, $.28	None	Flexible (sponsor determines end-user pricing)	$10 per call; $3 per call for children's programming	Included in cost	7% of total retail price (1)	60 days
	Data 900	Passive and interactive information, polling	50 states (4)	Order fee, $1,500 per account; installation, $0; program fee, $250	$1,000 for first line; $100 for each additional line; program storage fees include first 10 min of storage per month; additional storage is $.025 per minute per port	1 min, subject to 1-min minimum	First minute, $.35; additional minutes, $.20	Built into tapered usage schedule; applied to minutes of use within each level	Flexible (sponsor determines end-user pricing)	$10 per call; $3 per call for children's programming	Included in cost	7% of total retail price (1)	60 days
Telesphere Communications, Inc. **Oakbrook Terrace, Ill.** **(708) 954-7700**	National 900	Passive and interactive information, polling	38 states, excluding Idaho, Maine, Mont., N.D., S.D., Vt., parts of Mich., Neb., Nev. (4) (5)	Order fee, $1,000 per account; installation, $250 per line (3), $1,000 per 24 lines	1-11 lines (DS0) $125 per line (3); 12-24 lines (DS1), $1,350 per 24 lines	6 sec subject to 6-sec minimum	0-1,000,000 min, $.33; 1,000,000-2,000,000 min, $.31; 2,000,000-4,000,000 min, $.30; 4,000,000+ min, $.29; $.12 per call surcharge	Individual-case basis per account, retroactive to first minute	Flexible (sponsor determines end-user pricing)	None	Included in cost	20% first month held, rate adjusted based on history	60 days

FOOTNOTES

1. Sprint Gateways will cover all uncollectibles and unbillables. It will also cover chargebacks not in excess of $20 per phone number on each monthly end-user bill.
2. AT&T provides a promotional compensation for users with daily calls exceeding 2,000. This can provide savings of between $.02 and $.05 per call.
3. Telesphere also offers coordinated access service for space brokers (service bureaus). The monthly charge for this service is $20 per line or port.
4. Carrier can accept calls from this coverage area but may be hindered from end-user billing for those calls due to lack of equal access facilities. In such instances, the carrier may either absorb all costs for the calls or may block calls. Sprint usually absorbs costs; MCI and Telesphere block calls.
5. While Telesphere's geographic coverage is only 38 states, Telesphere says this represents more than 95% of the nation's population. However, the coverage area is still subject to limitations as noted in Footnote 4.
6. Subject to later adjustments as carriers receive billings from local exchange carriers.
7. Call minimum conversion rate is $.25 per call.
8. Volume discount plan will be effective Feb. 22.

The information in this chart was provided by the service providers listed. Questions about chart listings should be directed to the individual providers or to TeleChoice at (203) 645-0471.

SOURCE: TELECHOICE, INC., MANCHESTER, CONN.

(continued from page 47)

carriers develop the appropriate data bases, customers must change 900 numbers to switch carriers. However, you don't have to change 900 numbers to switch service bureaus if you own the lines.

■ **Access options.** Does the service bureau require full T-1 access, or can it support individual dedicated access links as well? For example, if you're planning to run a small application, some service bureaus may not support the required dedicated access lines and business-line access alternatives.

■ **Equipment capability.** Compare each bureau's equipment inventory to make sure future needs can be met. Information providers are constantly adjusting services to meet the needs of the marketplace better, and service bureaus must be outfitted to handle these adjustments.

■ **Use of owned equipment.** Can the information provider supply its own equipment? Some service bureaus limit the amount of equipment that may be brought on-site, and many charge extra for this privilege.

■ **Equipment manufacturer.** Being tied to a particular vendor's equipment limits your ability to switch service bureaus.

■ **Transfer capability.** You need to know if the service bureau can transfer inbound calls to another site. Some firms have only inbound capabilities. This makes it difficult if you later decide to route calls to live operators at your company site.

■ **Storage limitations.** You need to know the storage limitations of each service bureau's equipment. Some charge extra for storing more than a certain amount of recordings.

■ **Location of processing centers.** The location of the service bureau's processing center is critical when comparing service bureau costs because it can affect the taxes that apply to each call.

Calls that originate and terminate in the same state are typically subject to a whole range of state and local taxes that don't apply to calls that terminate outside the state. Look for service

(continued on page 56)

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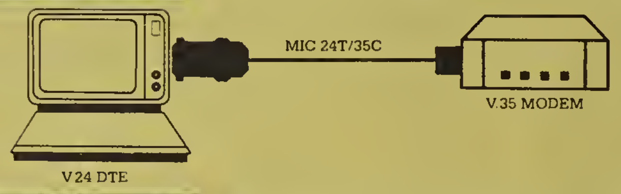

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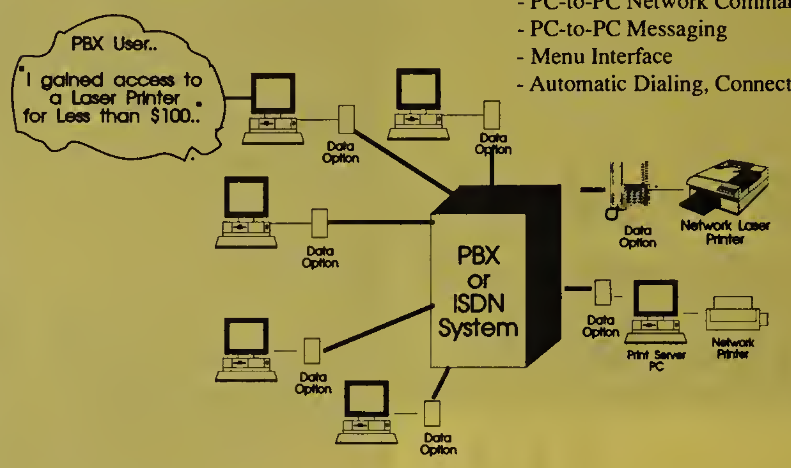

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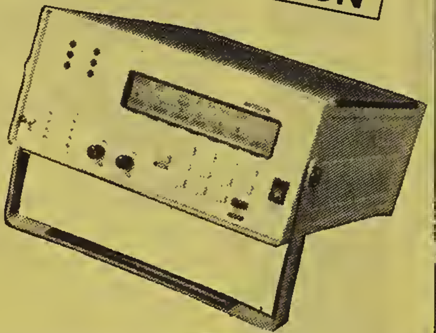

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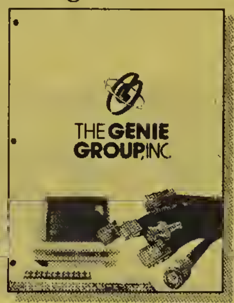

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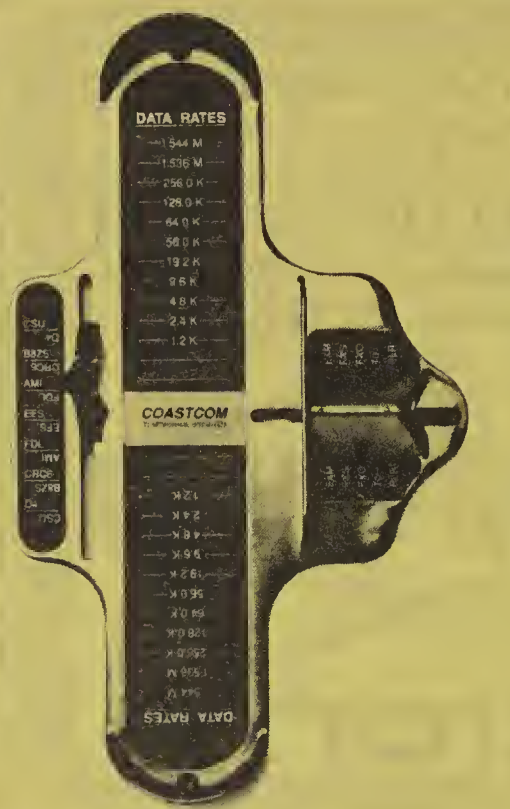

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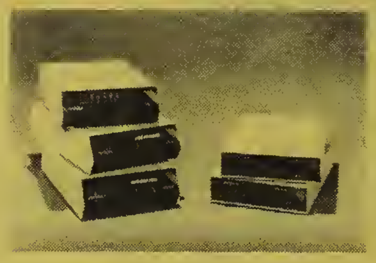

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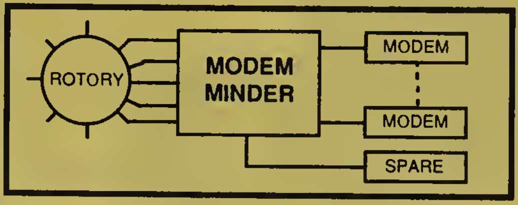

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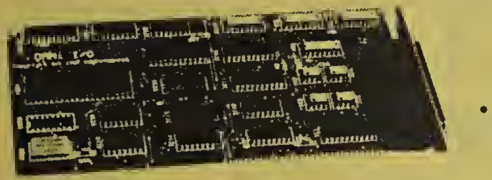

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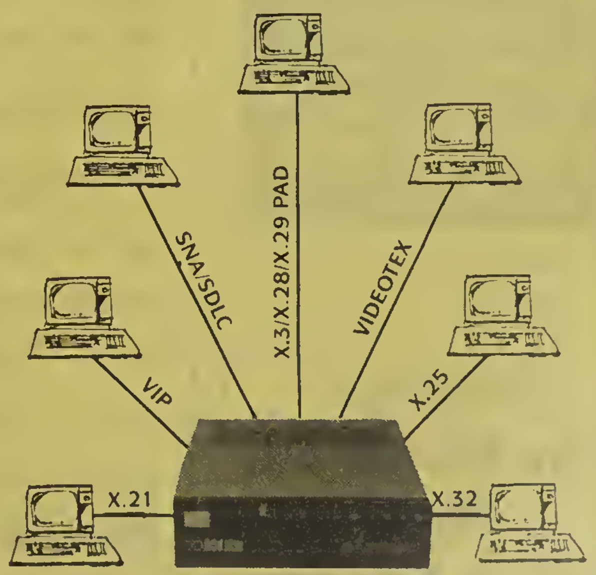

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Mar 5 - Telecom Buyer's Guide: T-1 and T-3 Multiplexers
Mar 12 - Datacom Buyer's Guide: Network Design Software - Harvey Study Issue - CeBit '90
Mar 19 - Telecom Services Buyer's Guide: BOC Centrex Offerings
Mar 26 - Bridging 4M & 16M Token LANs

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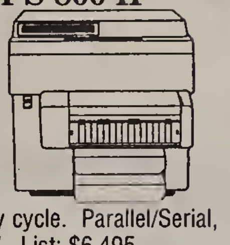

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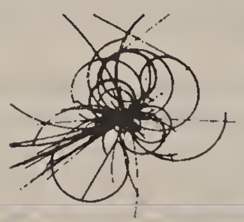

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Basic 900 services with bureau options

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Allnet Communication Services, Inc. **Birmingham, Mich.** **(313) 354-7000**	Market Reach (Enhanced Pricing Option)	Passive and interactive information, polling	Mich., Wis., Ill., Ohio and Ind.	Order fee, $1,500; installation, $0; program fee, $0 for standard programs, individual case basis for customized applications	$500 for first number; $100 for each additional number	6 sec, subject to 60-sec minimum	First minute: 0-50,000 min, $.42; 50,000-150,000 min, $.41; 150,000-250,000 min, $.40; 250,000-500,000 min, $.38; 500,000+ min, $.36; additional minutes: 0-50,000 min, $.34; 50,000-150,000 min, $.33; 150,000-250,000 min, $.32; 250,000-500,000 min, $.30; 500,000+ min, $.28	Basic, 5% to 20%, based on volume	Flexible (sponsor determines end-user pricing)	None	Included in cost	Minimum 7%	60 days
Sprint Gateways **Shawnee Mission, Kan.** **(800) 735-5900**	Voice 900	Passive and interactive information, polling	50 states (3)	Order fee, $1,500 per account; installation, $0; program fee, $250	$1,000 for first line, $100 for each additional line; program storage fees include first 10 min of storage per month; additional storage is $.025 per min per port	1 min, subject to 1-min minimum	First minute: 0-50,000 min, $.48; 50,000-250,000 min, $.45; 250,000-500,000 min, $.42; 500,000+ min, $.40; additional minutes: 0-50,000 min, $.38; 50,000-250,000 min, $.35; 250,000-500,000 min, $.32; 500,000+ min, $.30	Built into tapered usage schedule; applied to minutes of use within each level	Flexible (sponsor determines end-user pricing)	$10 per call; $3 per call for children's programming	Included in cost	7% of total retail price (1)	60 days
Telesphere Communications, Inc. **Oakbrook Terrace, Ill.** **(708) 954-7700**	Dynamic 900	Passive and interactive information, polling	38 states, excluding Idaho, Maine, Mont., N.D., S.D., Vt., parts of Mich., Neb. and Nev. (3)(4)	Order fee, $2,000; installation, $0	$2,000 minimum usage per account	6 sec, subject to 6-sec minimum	0-100,000 min, $.46; 100,000-150,000 min, $.455; 150,000-200,000 min, $.45; 200,000-250,000 min, $.43; 250,000-300,000 min, $.425; 300,000-350,000 min, $.42; 350,000-400,000 min, $.415; 400,000-500,000 min, $.41; 500,000-1,000,000 min, $.40; 1,000,000+ min, $.38; $.12 per call surcharge	Individual case basis per account, retroactive to first minute	Flexible (sponsor determines end-user pricing)	None	Included in cost	20% first month held; rate adjusted based on history	60 days
	Data-Cap 900	Passive and interactive information, polling	38 states, excluding Idaho, Maine, Mont., N.D., S.D., Vt., parts of Mich., Neb. and Nev. (3)(4)	Order fee, $3,750; installation, $250 per line (2), $1,000 per 24 lines	Account, 1,250 min minimum; lines: 1-11 lines (DS0), $125 per line (2); 12-24 lines (DS1), $1,350 per 24 lines	1 min, subject to 1-min minimum	$.75 per min; $.12 per call surcharge	Individual case basis per account, retroactive to first minute	Flexible (sponsor determines end-user pricing)	None	Included in cost	20% first month held; rate adjusted based on history	60 days

FOOTNOTES

1. Sprint Gateways will cover all uncollectibles and unbillables. It will also cover chargebacks not in excess of $20 per phone number on each monthly end-user bill.
2. Telesphere also offers coordinated access service for space brokers (service bureaus). The monthly charge for this service is $20 per line or port.
3. Carrier can accept calls from this coverage area but may be hindered from end-user billing for those calls due to lack of equal access facilities. In such instances, the carrier may either absorb all costs for the calls or may block calls. Sprint usually absorbs costs; MCI and Telesphere block calls.
4. While Telesphere's geographic coverage is only 38 states, Telesphere says this represents more than 95% of the nation's population. However, the coverage area is still subject to limitations as noted in Footnote 3.
5. Subject to later adjustments as carriers receive billings from local exchange carriers.

The information in this chart was provided by the service providers listed. Questions about chart listings should be directed to the individual providers or to TeleChoice at (203) 645-0471.

SOURCE: TELECHOICE, INC., MANCHESTER, CONN.

(continued from page 48)

bureaus that have multiple processing centers or at least one outside the state from which you expect to receive the most calls.

- **Optional services.** Some service bureaus provide enhancements to their service, such as reverse-identification services, which match the captured automatic number identification with a data base of names and addresses to build mailing lists.

Other services to look for are name and address collection from recordings, call tracking (following a call through the system for market research purposes) and documents on demand (receiving hard copy immediately via fax).

- **Cost factors.** Some cost factors to examine include monthly service fees, add-on per-minute charges, volume discounts, additional program charges and any extra charges that may exist.
- **Length of campaign.** In most cases, companies that are considering implementing a 900 program for a short-term promotion would not benefit from buying their own equipment. The service bureaus have invested many years and dollars in their 900 facilities, and it would not be worth the effort to duplicate them for a short-run 900 offering.

However, on a long-term basis, companies might want to consider buying their own equipment. Most industry experts would recommend running a trial of the 900 service with a service bureau first. But if you are considering taking this route, make sure you own the 900 number.

Local exchange billing

Once you've chosen a service bureau and carrier, you still have more issues to confront. Billing has and will continue to be a big problem with 900 services.

Local exchange carriers are unwilling to bill for some of the larger revenue-producing programs for fear of collection and image problems. Many limit the amount of money a carrier may collect for a given call; others will not bill for calls at all.

Except for specific applications, such as weather, sports and horoscopes, many local exchange carriers are not interested in dealing with 900 number service.

Unfortunately, fund-raising and merchandising — two of the largest revenue sources — are among those programs that most local exchange carriers do not want to touch. They are trying to avoid a situation in which a customer orders a product via a 900 service, is billed for the product through a monthly telephone bill and then calls the local exchange company with complaints.

AT&T has an edge on its competitors because the carrier provides its own account-inquiry services. Thus, AT&T deals directly with customers concerning questions about billing. AT&T can choose which services it wants to carry, while other carriers that rely upon local exchange carriers to do billing inquiries do not have this advantage.

The policies of carriers concerning collection problems vary. Carriers retain a portion of 900 profits to cover bad debt because of expected collection problems.

> Billing will continue to be a big problem with 900 services.
>
> ▲▲▲

The local exchange carrier billing constraints are a large part of the problem. Some carriers are limited in being able to specify which bad debt applies to which program because they do not get that information from the local exchange carriers. The carriers seek to limit bad debt by controlling program content.

The 900 industry has faced an uphill battle on the collection front as telephone subscribers continue to complain about 900 calls on their monthly bills. As a result, more than 15 states have passed 900-related legislation and other states have such discussion on the agenda.

The fact that AT&T performs its own billing inquiry service is significant. The standard policy of most local exchange carriers is to refund any questioned 900 charges. AT&T, on the other hand, evaluates billing questions on a case-by-case basis. This accounts for the larger amount of bad debt incurred by AT&T's competitors. Through its evaluation process, AT&T has the ability to control its own bad debt.

The future of 900

The carriers and service bureaus are working to enhance 900 program services to make them more valuable to the companies that provide them.

Telesphere, for instance, recently launched its Prizm 900 service, which combines many diverse data bases to create a complete analysis of 900 callers. Thus, information providers can receive a breakdown of all callers by geographic location, personality profile and demographic standing to get a broad categorization of the average 900 caller. This information is invaluable in designing targeted advertising.

Later this year, Sprint Gateways plans to expand its Target-List 900 marketing reports to make them similar to Telesphere's Prizm reports but with more features and functions.

To be successful, service bureaus and carriers must become more innovative in helping the information providers themselves differentiate their 900 numbers in the marketplace.

Sprint Gateways is building merchandising options into its 900 service that would allow products and services to be ordered via 900 services and processed by Sprint Gateways. The billing for the 900 call would be on the local telephone bill, but the merchandise would be billed on the caller's credit card invoice.

For corporate end users, the challenge is to find the best way to use 900 services. A complete marketing and sales program built around individual 900 numbers is not even close to becoming a reality.

Telecommunications managers must first cope with integrating 900 services with existing 800 and other corporate communications strategies. This will require education not only of other corporate decision makers, but also of consumers.

(continued from page 42)

management framework outside the Message Transfer Service.

EDI use of X.500

Determining how X.EDI will use X.500 Directory Services is another important part of the puzzle. X.EDI work on this topic remains unfinished and has not yet made it into the draft recommendations. The following description represents the author's best interpretation of the available working documents.

Subject to access control, EDI applications or users must be able to read, search or modify information in the directory to obtain addressing or capabilities information about other EDI users. More advanced usages, such as obtaining information about preauthorization agreements or terms of contract, may be considered in the future.

Currently, each EDI trading partner within a particular community is identified by a unique alphanumeric name. Such names are issued either formally by international naming/registration authorities or informally by the trading communities themselves.

Existing EDI applications must use the old naming structure. OSI-based applications such as X.400's IPM, however, should use a hierarchical naming structure to take full advantage of X.500's capabilities. Creating duplicate entries to achieve multiple views of the X.500 Directory would be highly undesirable.

Some experts would like to just re-encode.

▲▲▲

The challenge for the X.EDI Directories Working Group, therefore, was to identify not only which EDI user information should be stored, but also how they could mesh into X.500's global, hierarchical structure without disturbing the trading community's existing forms of EDI usage.

The X.500 alias, or pointer, entry will be used to cut through the tangled knot of backward compatibility. As shown in Figure 4 on page 40, trading communities will be stored as international organizations beneath the X.500 Directory Information Tree's (DIT) root.

EDI users will have alias entries beneath the trading community that point to the location of an entry somewhere in the DIT. EDI applications will then be able to access the EDI User Entry through the alias using their current conventions, while other OSI applications will be able to access the same entry using regular X.500 hierarchical naming.

Another task for the X.EDI Directories Working Group was to define the information types, or object classes, to be stored in the X.500 Directory. Object classes were created to represent the EDI user and the EDI-UA. The EDI user object contains an EDI name and capabilities attribute. The EDI-UA object class contains only the EDI capabilities attribute.

The EDI name is the alphanumeric string that identifies a particular EDI trading partner. The EDI capabilities attribute is a complex field that indicates whether the user supports EDIFACT, X.12 or UN/TDI. It also identifies the standard version number, standard syntax identifier, document type, document version, document release, controlling agency and agency assigned code in use by the particular EDI trading partner.

Remaining issues

More work is needed to nail down the nuts and bolts of responsibility, security and Directory Services. While it's still too early to implement products using X.EDI, the recommendations seem well on track for completion and approval in September 1990. Beyond that, according to CCITT Associate Rapporteur Myer, "The work plan is not yet in place. It's an open question [concerning] which topics will be addressed."

It's likely that there will be some interest in patching EDIFACT or X.12 syntax limitations using P.EDI or even in reencoding interchange formats using OSI's ASN.1. Existing EDI syntaxes are not robust enough to support cross-referencing from, for example, a purchase order to an engineering drawing in the same interchange. To overcome this problem, a cross-referencing capability was added to the P.EDI heading at the Rennes meeting.

Some X.EDI experts would like to go to the root of the problem and re-encode. However, a large entrenched EDI user base already exists. Therefore, migration to OSI's ASN.1, if it ever comes about, will be glacial in pace. Cross-referencing body parts could patch the problem and add a useful capability to the basic X.400 standard, but not all EDI will be carried over X.400.

X.EDI represents an important step in the evolution toward automated, interoperable trading. Today's legal statutes are lagging in the wake of the information age's technological explosion.

Nevertheless, the 1988 X.400 and X.500 recommendations provide a technical infrastructure upon which, in the absence of statutes, new legal or industry practices might coalesce.

For the first time in history, it will be technically feasible for ubiquitously connected computer application processes to obtain information about capabilities and agreements, indicate their acceptance of terms and post transactions over a secure messaging backbone.

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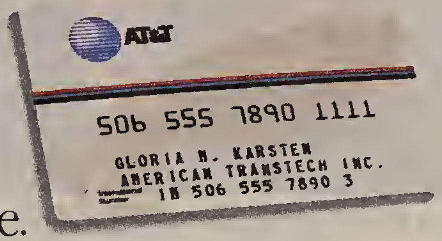

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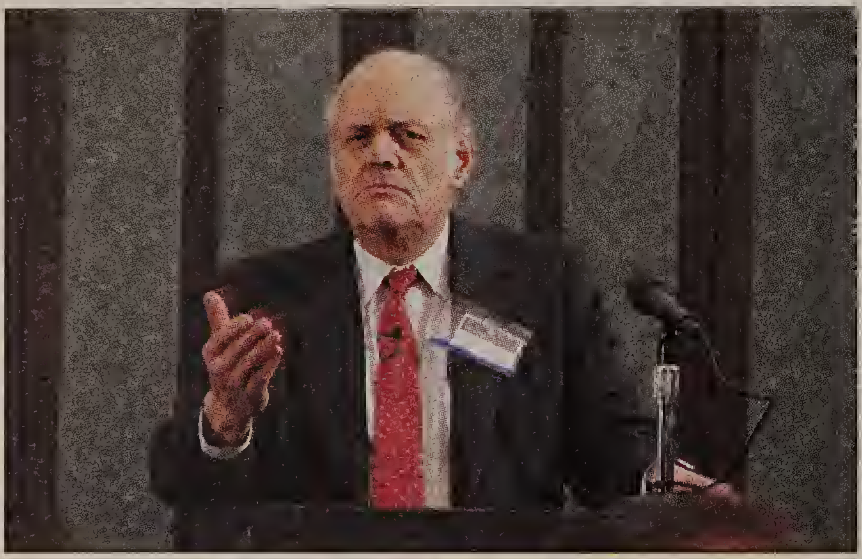
DEC widens server options

continued from page 1

DECnet applications across enterprisewide corporate networks, according to John Rose, group manager for DEC's Personal Computing Systems Group.

The new servers, the PC LAN/Server 333 and the Server 316, are based on the new DECstation 333c and 316+, Intel Corp. 80386-based machines from Tandy Corp. that DEC resells.



Ken Olsen speaking at DEC's Networld press conference

Both servers include 8M bytes of system memory and 170M bytes of disk storage. They come bundled with PCSA for OS/2 Server software, DEC's implementation of LAN Manager.

With PCSA for OS/2 Server, DEC has layered LAN Manager protocols on top of native DECnet transport protocols. The redirector function within LAN Manager formulates requests, and the underlying DECnet transport protocols provide the mechanism to transport the requests between servers and workstations as though they were DECnet packets.

When integrated into a DECnet network, the PC LAN/Server 333 and 316 provide MS-DOS and OS/2 workstations with transparent access to OS/2 LAN Manager file and print services. A maximum of 40 80286- or 80386-based workstations can be supported by a single server.

The only difference between the servers is the clock speed and pricing, Rose said. The PC LAN/Server 316, which features a 16-MHz clock speed, costs $10,215. The 33-MHz PC LAN/Server 333 is priced at $12,360. Both are scheduled to ship in May.

Client software that will enable DECnet workstation users to access the servers is embodied in the newly announced Version 1.0 of the company's PCSA for OS/2 software. PCSA for OS/2 1.0 allows users to simultaneously access file and print services from OS/2 LAN Manager servers.

The software supports all LAN Manager application program interfaces, including Named Pipes. It also supports task-to-task communications and the Network Basic I/O System interface, as well as all DEC network management facilities and diagnostic tools.

Users who buy PCSA for OS/2 client software will also receive the license for the upcoming All-In-1 Mail for MS-DOS component, a full-function X.400 wide-area mail package that will ship in the second quarter, Nussbaum said.

The PCSA for OS/2 client software runs on any 80286- or 80386-based system, including DECstations, IBM Personal Computer ATs and Personal System/2 models.

A single-user workstation license costs $195, and the PCSA for OS/2 server license is priced at $295. It will ship in May.

Besides providing access to LAN Manager servers, the client software will also enable users to access the newly enhanced PC LAN/Server 3100, a 32-bit MicroVAX server designed for LANs with between 30 and 120 workstations.

The PC LAN/Server 3100 has been enhanced to provide users with an up to 100% increase in file server performance and support for OS/2 workstations.

"We re-engineered the caching algorithm in the file management portion of the PCSA network operating system to more than double the performance," Rose said.

The enhanced PC LAN/Server 3100 will be available in March and is priced at $12,500 for the standard 8M bytes of memory and 104M bytes of disk storage.

Analysts said DEC's decision to support OS/2 LAN Manager based-servers within DECnet is a move that was long overdue.

"This announcement is DEC's acknowledgment that it has to support existing industry-standard network operating systems and not just its proprietary VMS servers," said Bill Redman, program director of the LAN communications service at Gartner Group, Inc. in Stamford, Conn. ◻

DEC lays out future plans

BOSTON — Digital Equipment Corp.'s announcement last week of new personal computer local-area network offerings was just as notable for what the company *didn't* announce, analysts said.

Among the items missing from DEC's announcement was a statement of direction for supporting token-ring LANs within the DECnet environment and confirmation on when and if the company will support Novell, Inc.'s Portable NetWare.

DEC officials seemingly quashed industry expectations that the company will support Portable NetWare, even as analysts continued to insist such a deal between DEC and Novell is already in the works.

John Rose, the company's group manager for the Personal Computing Systems Group, admitted DEC has "had some casual conversations with Novell [regarding support], but we have no plans at this time to support NetWare or Portable NetWare."

NetWare, Rose said, presents a more difficult challenge for DEC to support than LAN Manager because LAN Manager is an open software platform and NetWare is proprietary. "It's no trivial task for us to integrate Novell nets into larger DECnet enterprisewide nets," he said.

However, he did not rule out supporting Portable NetWare within the DECnet environment at some point in the future.

Bill Redman, program director of LAN communications services at Gartner Group, Inc. in Stamford, Conn., said he believes that DEC is being coy. "We know the two companies are having discussions, and DEC will support Portable NetWare for the simple reason that Novell is too formidable a force in the LAN industry for DEC to ignore," Redman said.

On the token-ring front, Ken Olsen, DEC president and chairman, said support for token-ring nets in DECnet is imminent. "We are committed to supporting token-ring nets in a DECnet environment, and we're working with third-party vendors to [resell] their adapters," Olsen said.

Rose declined to divulge the names of the token-ring vendors whose adapters are under consideration. But industry analysts said Simpact Associates, Inc. and Proteon, Inc. head the list of likely candidates.

"Adapters will be only one element of our token-ring product family. We are clearly going to provide integration capability to enable token-ring LANs to share files and messages with workstations and servers on Ethernets within the DECnet environment," Rose said.

"We'll also supply internetwork routers to transmit the token-ring data packets across networks and offer Personal Computer System Architecture client software to provide [Network Application Services] value-added services so that users on token-ring LANs can take advantage of all the wide-area networking, network management and advanced security features of DECnet," he added.

— *Laura DiDio*

Networld offers peek at gateway

continued from page 2

that are distributed across PCs and other processors at various levels on a network."

Microsoft expects the Database Gateway to speed acceptance of SQL Server.

"We were finding that a lot of people bought SQL Server and built prototype applications, but didn't put them into production because there was no link to mainframe data," said Dwayne Walker, SQL Server product manager at Microsoft. "There was a strong financial incentive for us to help get this product out: to sell more SQL Servers."

The transparency of the link from the application to the back ends does not extend to the location of the data. A query has to be addressed to DB2 or SQL Server.

"You still have to know where the data is when you make the query, so it's still a long way from that big distributed data base in the sky," said Bob Gill, a LAN industry analyst for Gartner Group. "But that's OK, especially at this price. And it's here today."

In beta test

According to Micro Decisionware, the gateway is currently being beta-tested at several corporate sites and will be released in mid-1990. The product comes in two pieces: a mainframe application running under IBM's CICS that is priced at about $35,000, and a $2,295 package that runs in an OS/2-based microcomputer equipped with an LU 6.2-compatible gateway.

The Gateway Server is based on Micro Decisionware's 5-year-old personal computer/SQL product, which provides a link between a stand-alone microcomputer and the same CICS back end the gateway uses to communicate with DB2. According to Micro Decisionware, there are about 80 corporate sites that already have the necessary back end in place.

At Networld, the data base link was demonstrated with the Communications Workstation, part of a line of Systems Network Architecture gateway products that Microsoft and Digital Communications Associates, Inc. are developing for use with OS/2 LAN Manager. In the demo, the Communications Workstation connected a LAN Manager net with SQL Server to DB2 on an off-site mainframe via a dial-up link.

Representatives of Microsoft and Micro Decisionware showed both Microsoft's Excel spreadsheet and DataEase International, Inc.'s DataEase SQL front end alternatively accessing SQL Server and DB2. They said existing applications using ANSI SQL should be able to access DB2 via the gateway as well.

Micro Decisionware plans to ship a Gateway Developer's Kit for $6,795 in April. This will include a limited-function version of the mainframe CICS application, plus the OS/2-based gateway software and a copy of the Microsoft/DCA Communications Workstation. ◻

Letters

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In hilly regions, however, such as the western part of Massachusetts, roof antennas, which offer superior reception, may be required.

Briere was correct in noting that hand-held models are "generally less powerful." What he neglected to detail is that they broadcast at 0.6 watts, one-fifth of the broadcast power of nearly all in-car or transportable models.

To raise the power of hand-held models, the manufacturers increasingly offer in-car booster systems into which they can be plugged that raise broadcast power to the three-watt limit. This is another useful option not mentioned.

The main appeal of transportables was not explained. These phones are usually moved from one antenna-equipped vehicle to another — or to a golf cart or boat on weekends.

Another option companies should consider for delivery vehicles is inbound-only service so that drivers can only receive calls and not place any of a nonbusiness nature. The carriers can also be instructed not to permit calls to be made outside of the carrier's territory.

Finally, the article doesn't discuss the special modems needed to permit tying of laptop computers and portable facsimile machines to cellular phones.

Mel Mandell
Free-lance writer
New York

It wasn't in the cards

The article "Interoperability is in the cards for Ethernet users" (*NW*, Jan. 22) didn't mention Racal InterLan.

This company has a 9% market share in Ethernet cards and ships more Ethernet cards than Everex Systems, Inc., Gateway Communications, Inc. and Standard Microsystems Corp. combined.

Mark Bennett
Director of product marketing
Racal InterLan
Boxborough, Mass.

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IBM RISC servers run AIX version

continued from page 2

systems and interoperability.

IBM's new servers are dubbed the POWERservers, for Performance Optimization With Enhanced RISC architecture. They range from the POWERserver 320, which supports about 25 users, to the POWERserver 930, which supports more than 150 users and delivers 41 million instructions per second (MIPS) and 13 million floating point operations per second (MFLOPS).

The POWERservers can be used as compute or file servers on token-ring or Ethernet networks, or as multiuser systems supporting ASCII terminals or IBM's new Xstation 120 terminal, an X/Windows terminal also announced last week. IBM said it will sell its first Ethernet adapter card under a reselling agreement with 3Com Corp. announced last week.

IBM said the servers offer premium performance, thanks to a new processor that executes multiple instructions in one cycle.

Analysts agreed the servers compare favorably to rivals.

For example, a Sun SPARCserver1 supporting 15 users is priced at $18,900, said John Dunkle, vice-president of WorkGroup Technologies, Inc., a market research firm in Hampton, N.H. By contrast, IBM's POWERserver supports about 25 users and is priced at $20,375.

"IBM's architecture is a screamer at numerical processing," he said.

IBM last week also announced AIX Version 3 for RISC System/6000, a new AIX version the company said combines features of AT&T's Unix System V and Berkeley Unix 4.3.

It offers integrated support for X.25, TCP/IP and NFS. IBM previously supported NFS only as an AIX option, said Judith Hurwitz, a senior consultant with Patricia Seybold Office Computing Group and editor of "Unix in the Office," Seybold's monthly Unix research report.

"IBM is trying to convince everyone that they go with standards — de facto and sanctioned," Hurwitz said.

IBM is also providing AIX SNA Services/6000, which offers links to Systems Network Architecture environments via standard SNA logical units — including LU 6.2, LU 0, LU 1 and LU 2 — via Token-Ring, Ethernet or X.25.

New with AIX Version 3 is support for NCS, which is used to distribute processing of an application across a network of servers and workstations. IBM last month announced NCS support for its TCP/IP for OS/2.

Eventually, IBM will likely support LAN Manager/X, the Unix version of LAN Manager, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C. consultancy. That would position the servers to support DOS or OS/2 clients.

IBM will support two graphical interfaces with the new AIX. AIXwindows Environment/6000 is based on the Open Software Foundation, Inc.'s OSF/Motif graphical user interface. It supports X/Windows, which lets users call up applications running on different network devices in separate windows.

AIX NextStep Environment/6000, is based on the NextStep interface from NeXT, Inc. It is an object-oriented graphical interface intended to ease application development.

Downfall puts 500 out of work

continued from page 4

er portfolios are liquidated.

Also scrapped last week were plans to create a T-1 network — dubbed the Wideband Integrated Network — supporting voice and data traffic for U.S. operations. Drexel planned to sell excess net bandwidth (see "Drexel builds T-1 network to support new enterprises," *NW,* Feb. 5).

"The whole thing happened so fast that nobody knew what was happening," said a senior telecommunications executive at the company. "I don't see any bitterness or anything like that. I think we're all kind of numb."

Drexel currently operates an international net linking sites in 40 countries. It also has a fiber network supporting facilities in lower Manhattan and a backbone data net of 56K bit/sec circuits linking sites in New York, Chicago and Beverly Hills, Calif., with lower speed lines to smaller sites.

In a mad dash to sell off pieces of the securities and junk bond giant, Drexel executives reportedly granted IS executives authority to market their operations to prospective buyers. But the end came so quickly, there were few takers for Drexel equipment or staff.

"If someone called me real fast, they could take the people in my net groups in toto and really make out," said Gerard Higgins, senior vice-president of data processing and communications.

Higgins is collecting resumes of IS personnel and has contacted other brokerages to drum up support for on-site job fairs for former Drexel employees. But an industrywide slowdown that has seen more than 40,000 people laid off since the 1987 stock market crash does not bode well for Drexel employees.

"The industry's been retrenching. The market people and the systems people will have a rough time finding jobs, at least in this industry," said Andrew Sokolov, vice-president of communications systems at Shearson Lehman Hutton, Inc.

K mart upgrades national net

continued from page 2

from old IBM Series/1 minicomputers at its stores to more powerful Unisys Corp. 486-based Series 6000 personal computers to support in-store programs that track sales and inventory.

This also marks the first full year in which K mart will have its MCI Communications Corp. Vnet virtual network for voice traffic up and running.

Even though K mart calls itself the "first major private VSAT user," competitors have stolen its thunder recently by installing VSAT nets in much less time. "I would agree that we were behind the industry in 1985 and weren't as aggressive as we could have been," Carlson said. "We are certainly among the leaders as we enter 1990, however."

In June of 1986, K mart announced an agreement with GTE Spacenet Corp. to build a VSAT network — what Carlson calls "the guts" of K mart's network strategy.

By year end, all of K mart's 2,200 stores — that is, those that are allowed by zoning laws to use VSATs — will be linked via the VSAT net with the retailer's data center here. The center is anchored by IBM 3090 and Amdahl Corp. 5990 mainframes.

"I've never been associated with a project that was so leading edge and worked so smoothly," Carlson said of the VSAT project, which now supports 1,550 stores.

Currently, more than 80% of K mart's data traffic is supported by the VSAT net and most of the rest will be swapped from the Vnet network to the VSAT net by year end. Carlson said he has no qualms about sending nearly all of K mart's data over the satellite network, since it has rewarded him with 99.7% uptime.

The VSAT net supports three major classes of applications: credit authorization, videoconferencing and batch processing, which involves uploading sales data to the data center.

Pays the bills

It's the on-line check and credit authorization application that "pays the bills," Carlson said. The application is expected to save K mart more than the $50 million it cost to install the VSAT network over the anticipated 10-year life span of the net, he said.

In essence, K mart is rewarded with low discount rates by the credit authorization organizations for using the on-line approval system. The on-line authorization system is also a boon to K mart customers because it has cut the credit-check processing time from 30 seconds to about seven seconds, Carlson said.

Videoconferencing also promises to improve customer service at K mart stores, Carlson said. Videoconferencing, which K mart put into full swing last year, is available in the store managers' offices and employee lounges at some 1,550 K mart stores.

Among the topics discussed during biweekly store manager videoconferences are solutions to customer complaints nationwide, Carlson said.

The VSAT net also supports the batch processing of some 12 billion bytes of data, including electronic mail, that moves back and forth between K mart headquarters and its stores every month. Information about every sale made in every K mart store — which is collected at POS devices — accounts for about another 16 billion bytes per month of batch processing traffic.

In coming months, K mart will begin installing new Unisys 486-based personal computers that will act as servers on the retailer's in-store IBM Token-Ring Networks — a role that the IBM Series/1 devices are not able to play, Carlson said. The LANs support such devices as POS controllers and computers used by K mart's pharmacy departments.

The Unisys devices will support the new K mart Information Network II platform on which applications used to run in-store operations are built. For example, the 486-based devices will be tied via radio waves to hand-held Telxon Corp. terminals that store clerks will use to check on the status of various items from the sales floor, Carlson said. "These systems support us at the moment of truth every time a customer walks into a store and asks if we have what they want at a reasonably low price," he said.

AT&T, DG wares make debut

continued from page 4

The LAN Manager Server is network-independent and can support AT&T's Starlan and other industry-standard Ethernet LANs as well as IBM's Token-Ring Network and compatible networks.

It also supports all LAN Manager application program interfaces, including Named Pipes and Mailslots, according to Bill O'Shea, AT&T's Computer Systems vice-president of product management and development.

Shea said LAN Manager Server will enable users to preserve their existing investments in AT&T's older MS-Net-based Starlan products because the products use the same Server Message Block transport protocols.

AT&T's Unix-based LAN Manager will also enable its users to access distributed LAN applications, such as SQL Server, that have been ported to AT&T's Unix System V.

"When users buy the Unix version of Sybase's SQL Server, they simply load it onto the LAN Manager Server and run it the same way they would any other application," Ziemann explained.

AT&T's LAN Manager Server gives users the best of both the Microsoft LAN Manager and Unix System V worlds while abrogating the inherent complexities of Unix, said Patrick Smyth, AT&T's Group Product Manager for Networking Software.

"We're giving them all of the remote administration and advanced security features of Unix System V overlaid with the user-friendly LAN Manager interface," Smyth said. "Mainstream LAN users will only see the Microsoft OS/2 LAN Manager interface."

The AT&T LAN Manager server is the second Unix-based version of LAN Manager to ship. Last December, Hewlett-Packard Co. began shipping its LAN Manager Unix product, which is based on the University of California at Berkeley Unix BSD Version 4.2 implementation.

StarGroup Software LAN Manager Server costs $3,495 for an unlimited user configuration and $1,895 for an eight-user version. It is scheduled to ship next month.

DG's Portable NetWare

DG used Networld '90 to unveil its version of Novell, Inc.'s Portable NetWare, called NetWare for AViion Systems.

NetWare for AViion is the first implementation of Portable NetWare that runs on a Unix-based platform using RISC technology. The AViion servers, introduced about a year ago, utilize the Motorola Corp. 88000 RISC microprocessor and DG's proprietary version of Unix called DG/UX.

The Portable NetWare for AViion servers support Apple Computer, Inc. Macintoshes, MS-DOS, OS/2 and Microsoft Corp. Windows/386-based workstations, according to Stephen Paul Baxter, DG's vice-president of corporate marketing.

NetWare for AViion servers can provide users with all network resources, such as access to file and print services and data bases while simultaneously executing other network services or NetWare applications.

NetWare users can also use Novell's Virtual Terminal facility to access existing Unix applications on the AViion server.

NetWare for AViion Systems costs $6,550 for a one- to 64-user system on an AViion 4000 server. The product will ship in May.

Baxter said the company will begin shipping another version of Portable NetWare that runs on its Eclipse MV family of minicomputers in the second half of 1990.

Baxter also said DG plans to support Microsoft's OS/2 LAN Manager and LAN Manager Unix. He said it will be introduced sometime this year, but he declined to disclose any product specifications.

Provisions could end restrictions

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According to Russell Pipe, publisher of the Washington, D.C.-based newsletter "Transnational Data Report" and a consultant to several carriers on the GATT process, treaty clauses have been proposed that, in essence, define unrestricted access to network facilites as an essential part of free trade.

Under these clauses, carriers that deny users access to basic network capabilities can be accused of restricting free trade as defined under the GATT treaty.

That could happen if a network facility is deemed to be an essential part of a user's business and if lack of access to the facility puts the user company at a disadvantage compared to domestic competitors.

Users would have to take their complaints to their government, which would then have the option of either pressuring a carrier and its government directly or taking the issue to mediation.

User perspective

"The GATT negotiations have taken a decided turn toward user issues,'' Pipe said.

Pipe cautioned, however, that no final treaty has been established and that provisions relating to users could eventually be eliminated. But Weiss said he considers this unlikely. "The entire industry is asking for it,'' he said.

According to Weiss, there is broad user interest in employing GATT to end carrier restrictions because no effective alternative exists.

Other international communications forums, such as the Consultative Committee on International Telephony and Telegraphy and its parent, the International Telecommunications Union, focus mostly on technical issues and do little to end restrictive carrier practices, he said.

A Trojan horse?

Some users warned that relying on the GATT treaty could create a regulatory Trojan horse. Peter Smith, INTUG chairman and international communications manager with London-based Reuters Holdings PLC, said foreign countries could use the GATT treaty to slap greater restrictions on user networks as compensation for opening markets in other areas.

"It could mean that telecommunications becomes an international trade issue, which isn't necessarily a good thing for users,'' he said.

NCR architects application strategy

continued from page 1

consists of NCR Desktop — an object-oriented graphical user interface — and a set of industry-standard application program interfaces (API) that enable developers to build communications protocols and other software routines into OCCA-compliant applications.

When implemented, the client portion of OCCA applications will run on microcomputers attached to token-ring, Ethernet or AT&T Starlan local-area networks.

Each client will also support the NCR Desktop interface, which runs on top of Microsoft Corp.'s Microsoft Windows on DOS clients, Presentation Manager on OS/2 clients and the Open Software Foundation, Inc.'s Motif on Unix clients. Clients will communicate with LAN-attached OS/2- or Unix-based work group servers that are running network operating systems such as Microsoft's LAN Manager or its Unix counterpart, LAN Manager/X.

If the client request cannot be met by the server, the server will forward the request on to the target server using the appropriate communications facility. OCCA defines the use of such wide-area network protocols as IBM's LU 6.2 and Open Systems Interconnection's X.25, X.400 and X.500.

NCR Desktop will display objects as icons on client screens. Those icons can represent documents consisting of text, graphics and images that are stored on different systems on a LAN or on larger SNA or OSI nets.

The APIs available with Cooperation will facilitate the development of programs that use industry-standard protocols such as X.400 and OSI's File Transfer, Access and Management (FTAM) protocol to transmit messages and files between systems.

Additionally, Cooperation includes APIs to build applications that use ANSI-standard SQL to access data managed by IBM's DB2 data base management systems and Oracle Corp.'s line of DBMSs running on various vendors' hardware. Cooperation will also include integrated management tools based on NCRnet Manager software, announced last month.

Analysts said OCCA can be likened to an open systems version of IBM's Systems Application Architecture (SAA), which lets developers build applications that run across IBM's line of processors. Although SAA includes support for OSI, SAA applications will still have to run on IBM processors, analysts said.

"NCR is saying the same thing IBM said through SAA except NCR is saying it on a nonproprietary level,'' said John Dunkle, vice president of WorkGroup Technologies, Inc., a Hampton, N.H.-based market research firm.

The strategy also differentiates NCR from Digital Equipment Corp. and Hewlett-Packard Co..

Both DEC and HP have announced architectures to help developers build client/server applications. But DEC requires users to run the server portion of All-In-1 Phase II applications on VMS-based machines, while initial releases of HP's NewWave Office server software will run under HP's proprietary MPE and its version of Unix called HP-UX.

NCR's move toward open systems software is leading some analysts to believe the vendor will eventually abandon some of its proprietary operating systems.

"Two years from now, NCR will only sell two types of computers: personal computers and Unix platforms,'' said George Colony, president of Forrester Research, Inc., a Cambridge, Mass.-based consultancy.

Cooperation pricing ranges from $30,000 to $90,000 for a 16-user license. A 64-user license costs between $90,000 and $180,000.

Livermore Labs reflects on ISDN

continued from page 1

the central office switch to replace a 20,000-line Centrex.

The $30 million project, which included rewiring the lab's 1-sq.-mi. campus and installation of a fiber-optic Ethernet backbone, is expected to insulate the lab from Centrex rate hikes and save $40 million over 10 years. That estimate, which lab officials labeled conservative, represents savings above and beyond the project costs.

The 5ESS switch anchoring the network is configured with 12 remote switch nodes, each of which supports between 400 and 3,000 lines and is connected to the switch hub via fiber.

The 8,100 users supported by BRI lines are using one 64K bit/sec B channel for voice and the 16K bit/sec D channel for packetized data communcations. The second B channel is currently only used for data transmission by host computers but might be activated to support future workstation applications.

Lessons learned

Perhaps the most important lesson learned is that many Centrex services and features do not map into ISDN, said Art Krakowsky, telephone operations manager at the laboratory.

More than 100 paging systems used at the lab could not perform in the same manner under ISDN. And BRI supports a slew of call coverage features, such as conferencing, differently than Centrex, Krakowsky explained.

For example, with the key systems used with Centrex, an incoming call could typically be answered from any of 100 stations, whereas with ISDN, an incoming call can only be answered from eight stations.

To provide ISDN users with Centrex-like functionality, the Livermore staff developed a function that enables a call recipient to pick up calls by dialing a number, which is translated by the 5ESS into another number that picks up the call.

Doing their homework

Learning the call coverage routines of each group on the campus and translating them into ISDN "was extremely painful,'' Krakowsky said. "It took a lot more time and energy than anybody thought it would.''

Besides the fact that each group used the Centrex system differently and the sheer size and diversity of the lab's user population made surveying needs time-consuming, the process was complicated by the fact that Lawrence Livermore performs 6,000 to 7,000 moves, adds and changes annually. It was difficult to keep the survey up to date with the constantly changing complexion of the production system. Some users had to be surveyed multiple times.

The analysis also uncovered other unexpected problems.

For example, the project team asked users about the communications software packages they were using to determine the level of compatibility required for a central modem pool. To the team's surprise, the analysis showed there were between 100 and 150 software packages in use on the campus.

Lawrence Livermore's Bill Maciel and Art Krakowsky.

In order to set a reasonable standard for which AT&T could provide compatibility, the project managers had to narrow this number down and specify roughly 20 software packages that both the switch and modems would support.

On-site support

Another important lesson the lab learned — and quickly impressed upon AT&T — was the importance of having data communications and design experts on-site full time.

Although AT&T was initially reluctant to dedicate staff members to the project, it responded diligently once the magnitude of the problems became clear.

"To attempt to do something like this remotely or on a time-share basis just wasn't going to work,'' according to Greg Suski, project leader at Lawrence Livermore.

"AT&T was most successful when they brought key data people on-site because many of the problems were things you had to stay with day and night in order to resolve,'' Suski said. From a design perspective, it was also important to have AT&T personnel on-site to see firsthand what the cabling needs and physical plant layout were, according to Bill Maciel, manager of telecommunications services.

Seek input

Other unforeseen problems involved ISDN hardware.

One surprise was related to incorrect specifications regarding the maximum permissible cable lengths for wires supporting T interfaces to ISDN station equipment.

Those specifications did not take into account multiple splices, which foreshortened some cable runs and left phones inaccessible.

To solve the problem, AT&T installed lines supporting U interfaces and terminated them using NT1 devices that act as U-to-T converters. The distance limitations with the U interface are not as stringent as with the T interface. AT&T picked up the costs associated with that oversight.

Lab management also decided that the threat of a power outage disabling its ISDN phones — which require local power — posed too great a risk for a federal research facility. The lab stipulated that it needed a minimum of four hours of backup capability, and AT&T devised a system that later became a commercially available product.

A nagging problem whose cause has not been determined yet involves cellular telephones. When one is placed near an ISDN set, the interference can prevent ISDN telephones from operating.

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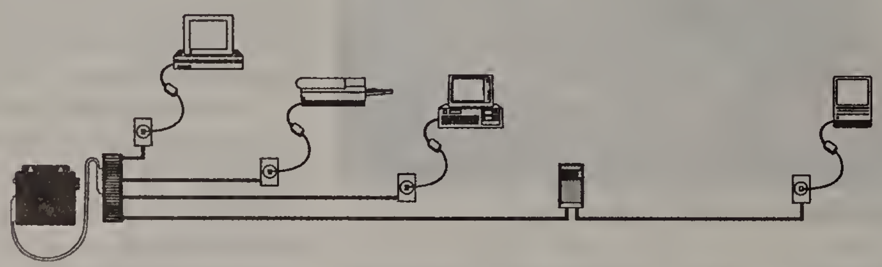

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